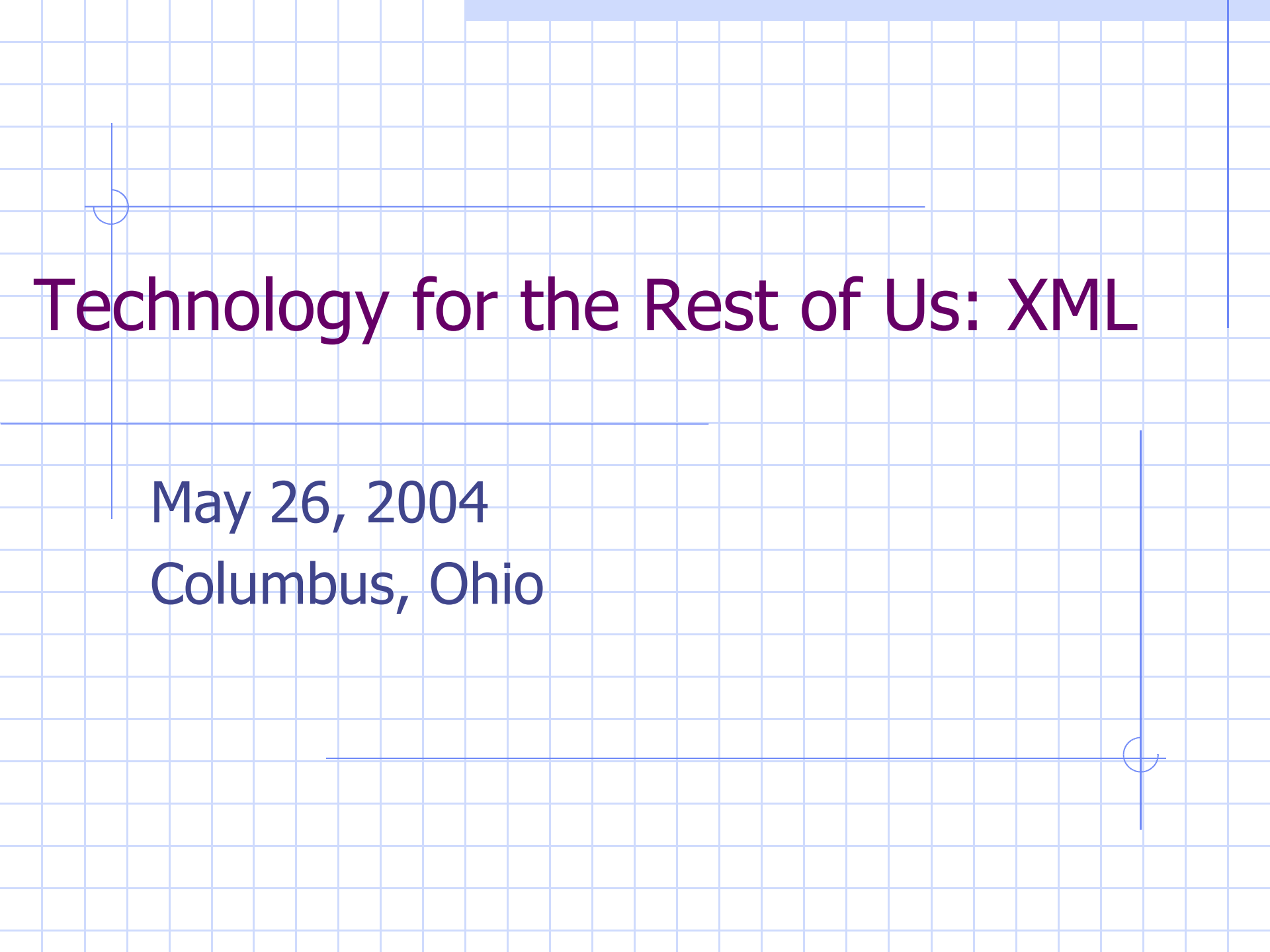




Technology for the Rest of Us: XML

May 26, 2004
Columbus, Ohio





Ron Gilmour

Science & Technology
Coordinator

Hodges Library, University of
Tennessee at Knoxville

gilmour@lib.utk.edu



Presentation Materials

<http://web.utk.edu/~rgilmou1/xml4ohio/>

I. Markup Languages

History & Philosophy

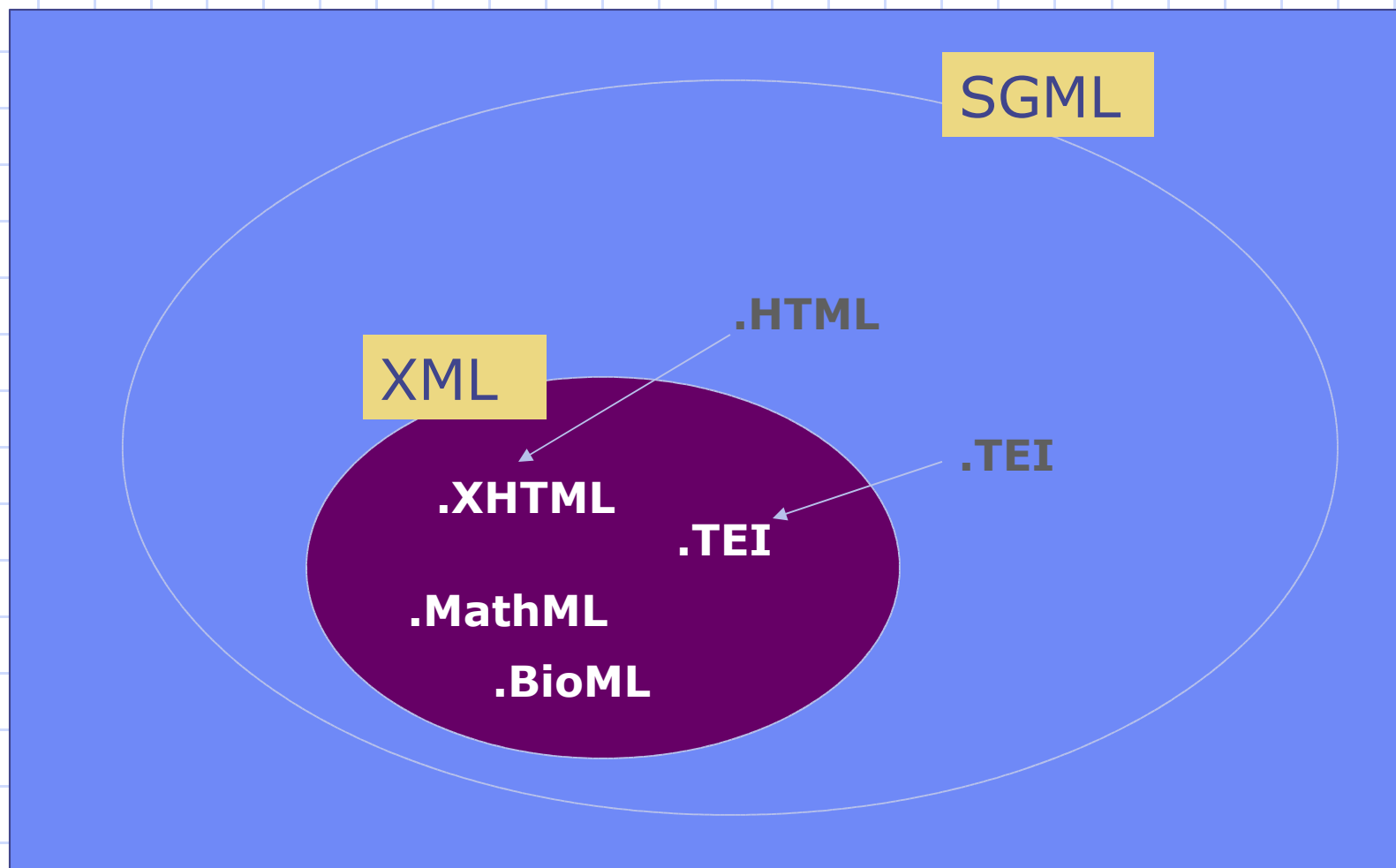
The Main Point

The fundamental purpose of good markup is to clarify meaning and to facilitate intelligent use of information.

Markup with Tags

`<important>word</important>`

SGML Markup Map



Presentational Paragraph

<paragraph>My object in coming here was to see the great beds of shells, which are elevated some yards above the level of the sea. They nearly all consist of one species of <italic>Erycina</italic>; and these shells at the present day live together in great numbers, on the sandy flats.</paragraph>

Semantic Paragraph

`<paragraph>`My object in coming here was to see the great beds of shells, which are elevated some yards above the level of the sea. They nearly all consist of one species of `<taxonomicName rank="genus">`Erycina`</taxonomicName>`; and these shells at the present day live together in great numbers, on the sandy flats.`</paragraph>`

Presentational Menu Item

Chicken with Orange Flavor -
Tender fillets of marinated chicken,
delicately sauteed and seasoned w.
imported orange peels. **\$8.30**
**
**

"Semantic HTML" Menu Item

```
<div><span class="item_name">Chicken with  
Orange Flavor</span>- Tender fillets of  
marinated chicken, delicately sauteed and  
seasoned w. imported orange peels.
```

```
<span class="price">$8.30</span></div>
```

Semantic XML Menu Item

```
<menu_item>
```

```
<item_name>Chicken with Orange  
Flavor</item_name>
```

```
<item_description>Tender fillets of  
marinated chicken, delicately sauteed  
and seasoned w. imported orange  
peels. </item_description>
```

```
<price>$8.30</price>
```

```
</menu_item>
```

II. Basic XML

Syntax & Well-formedness

Parts of an XML Document

1. XML Declaration
2. Document Type Declaration
3. Elements
4. Attributes (these are really parts of elements)
5. Entity References
6. Comments
7. Processing Instructions

XML Declaration

```
<?xml?>
```

```
<?xml version="1.0"  
encoding="UTF-8"  
standalone="yes"?>
```

Document Type Declaration

Answers the question "What kind of document is this?"

```
<!DOCTYPE menu SYSTEM "menu.dtd">
```

This document is a menu.

HTML Doctype

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD  
HTML 4.0 Transitional//EN">
```

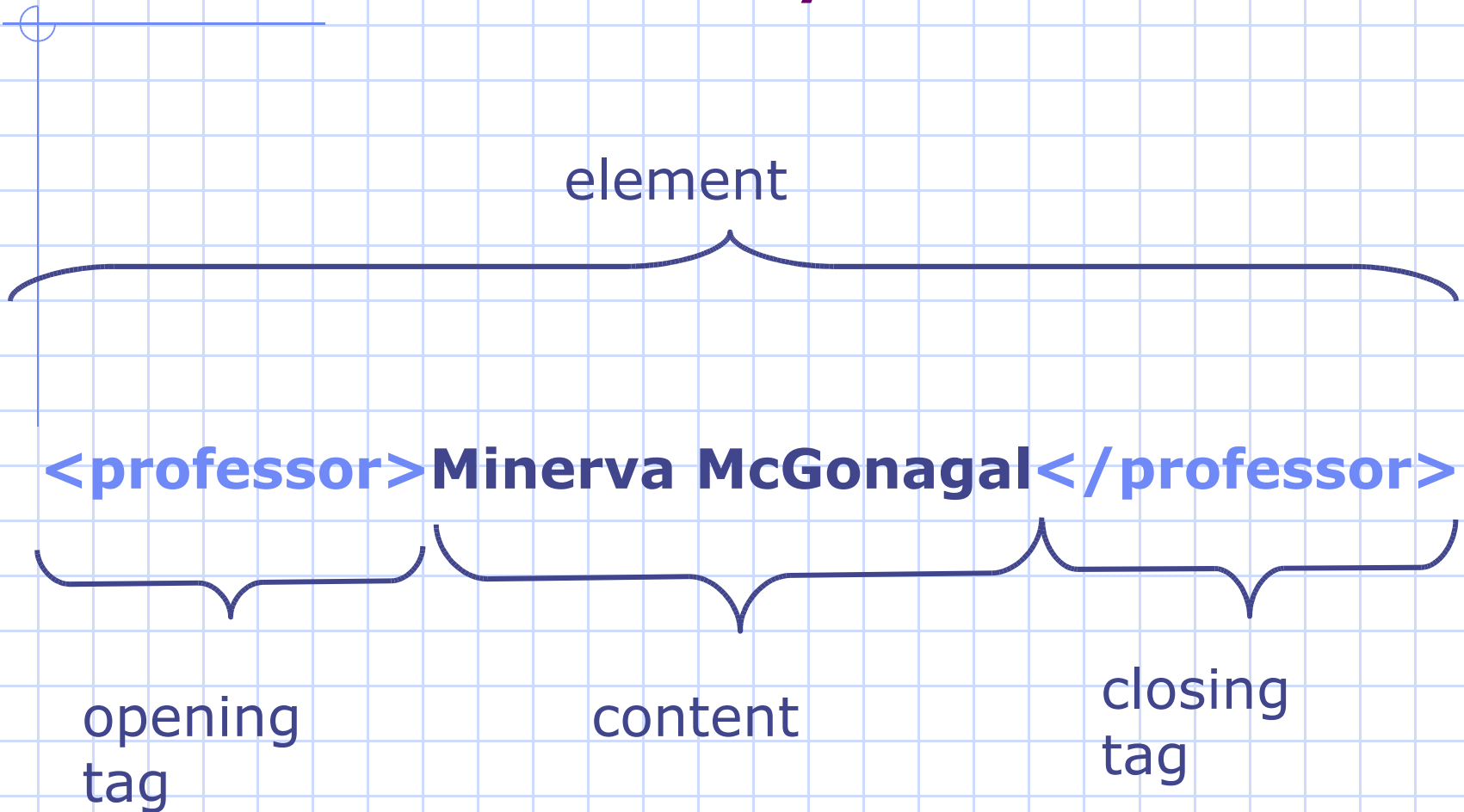
```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD  
HTML 4.0 Transitional//EN"
```

```
"http://www.w3.org/TR/REC-  
html40/loose.dtd">
```

Elements

- ◆ Consists of an opening tag, content, and a closing tag.
- ◆ The content may contain text, other elements, or both.
- ◆ The only truly required part of an XML document.

Element Anatomy



Empty Elements

`<lineBreak> </lineBreak>`

OR

`<lineBreak/>`

OR

`<lineBreak />`

Attributes

- ◆ Take the form of name/value pairs
- ◆ Appear inside the opening tag
- ◆ Are often used to qualify or add information about an element

Attribute Examples

```
<price units="usd">9.95</price>
```

```
<a href="http://www.google.com/">google</a>
```

```

```

Entity References

- ◆ A way of reading external data into an XML document
- ◆ Take the form `&entity_name;`
- ◆ Used in HTML for special characters (e.g., `é` for é)

Comments

You'll be happy to know that these work just like in HTML:

```
<!-- This is a comment -->
```


Processing Instructions

Used to pass instructions to the XML-processing software

```
<?xml-stylesheet  
type="text/css"  
href="stylesheet.css"?>
```

All the Parts Together

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<!DOCTYPE note SYSTEM "note.dtd">
```

```
<?xml-stylesheet type="text/css"  
href="notestyle.css"?>
```

```
<note type="informal">
```

```
<!-- This is a comment. -->
```

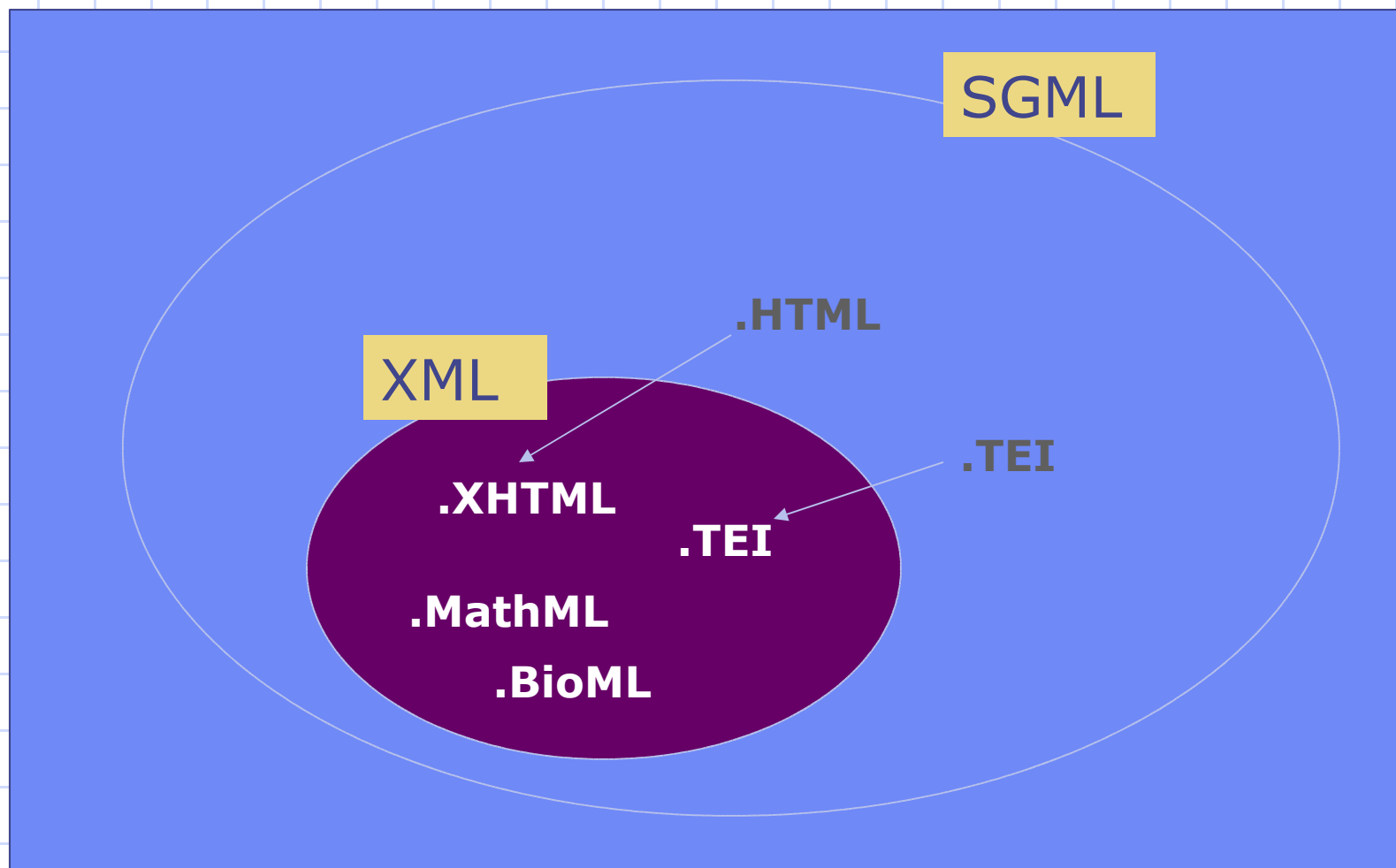
**This is a sample of a short XML document
with all the basic parts & pieces.**

```
</note>
```

"Rightness" in XML

- ◆ **Well-formed**: follows syntactic rules from the XML 1.0 specification
- ◆ **Valid**: follows structural rules specified in a Document Type Definition

SGML Markup Map



Rules of Well-formedness

- ◆ All elements must have closing tags.
- ◆ All attribute values must be quoted.
- ◆ All elements must be strictly nested.
- ◆ Each document must have a single element which encloses the entire content of the document.

Closing Elements

`<speciesName>Magnolia
grandiflora</speciesName>`

`<horizontalRule />`

Quoting Attributes

``

or

``

Strict Nesting

<A>content

NOT

<A>content



The Root Element

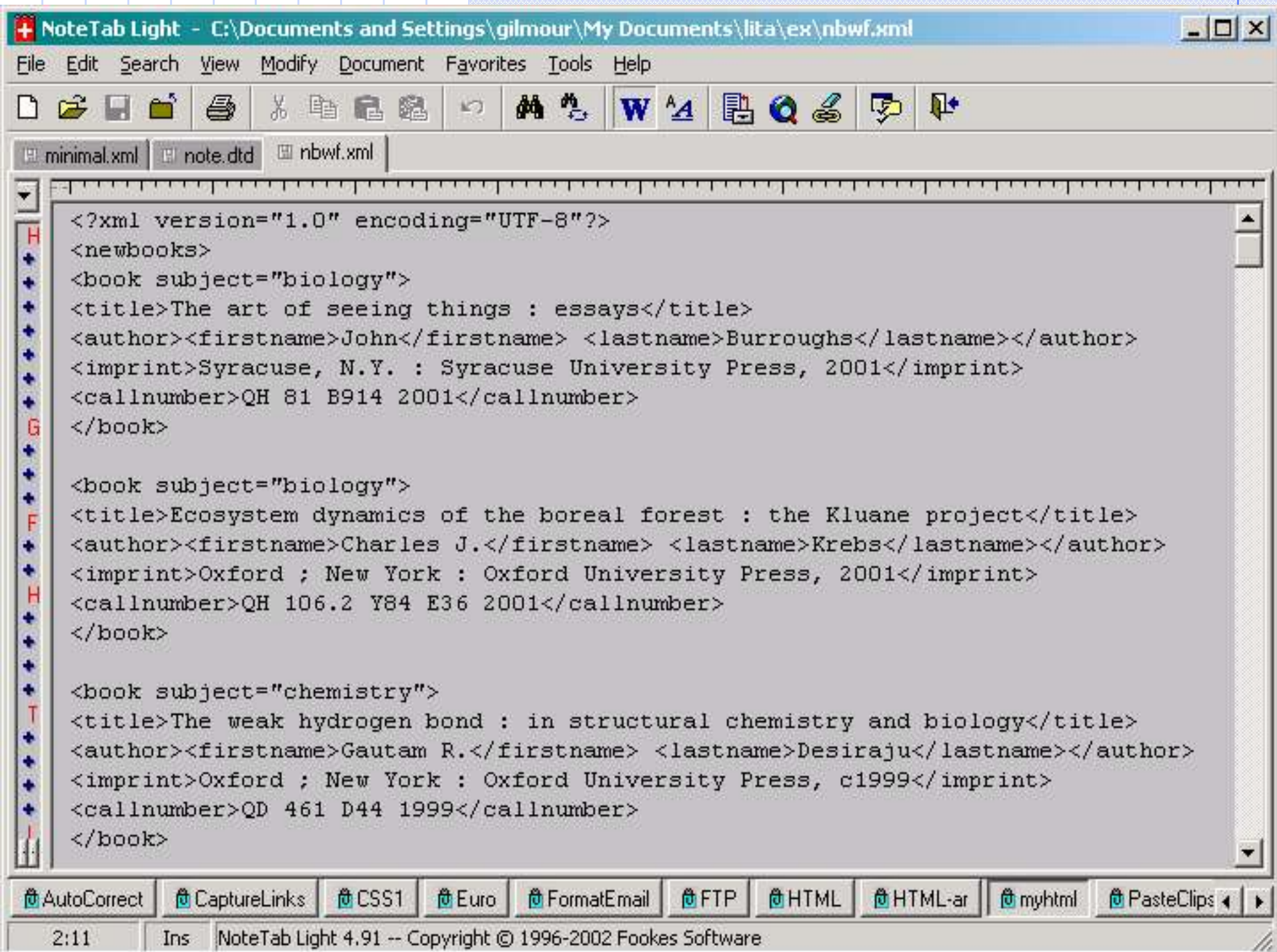
- ◆ Must enclose entire content of document.
- ◆ For valid documents, this must be synonymous with the name given in the DOCTYPE declaration.

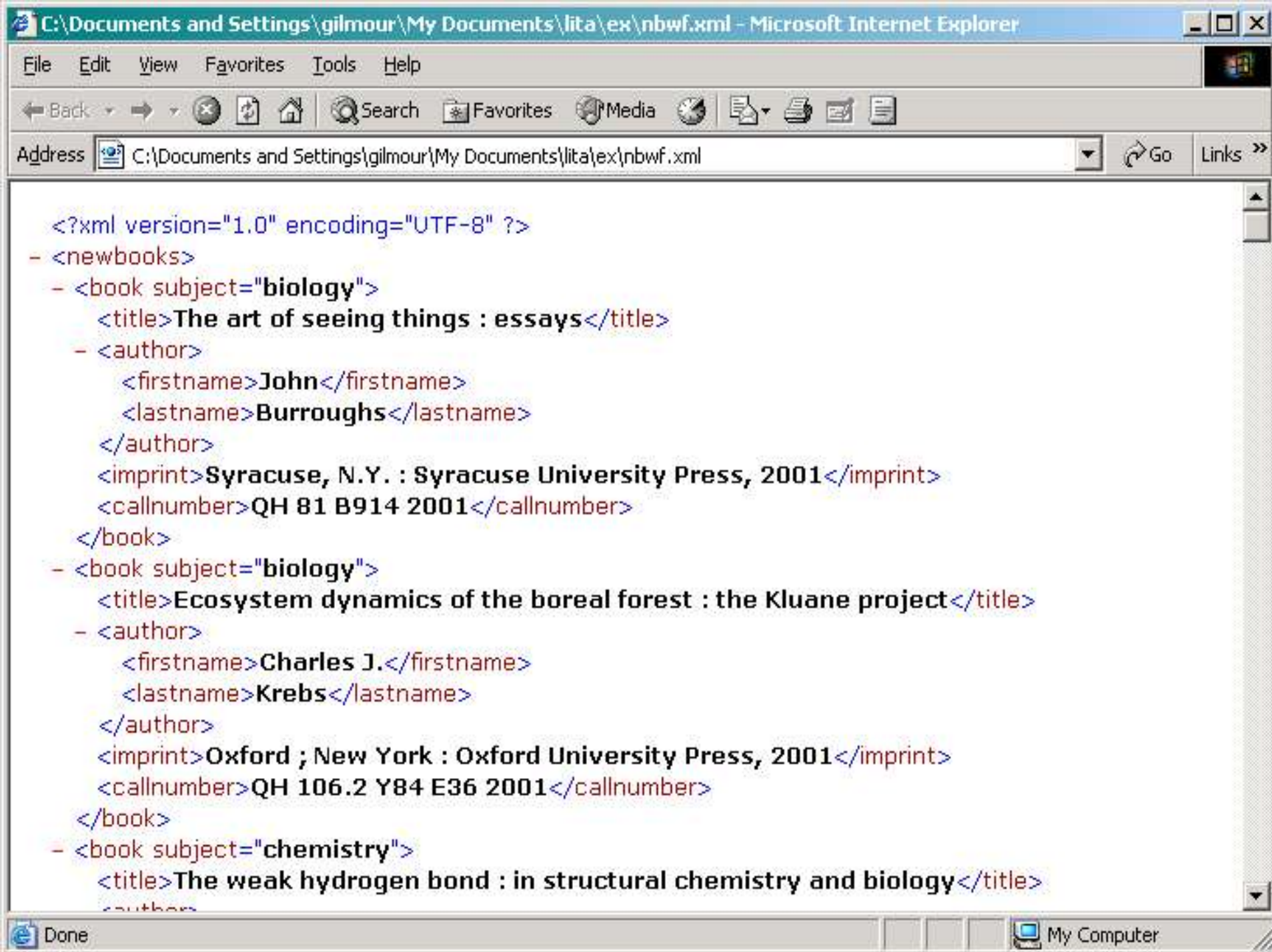
Case Sensitivity

<SomeTag>content</SomeTag>



<SOMETAG>content</SomeTag>








minimal.xml note.dtd nbwf.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<newbooks>
<book subject="biology">
<title>The art of seeing things : essays
<author><firstname>John</firstname> <lastname>Burroughs</lastname></author>
<imprint>Syracuse, N.Y. : Syracuse University Press, 2001</imprint>
<callnumber>QH 81 B914 2001</callnumber>
</book>

<book subject="biology">
<title>Ecosystem dynamics of the boreal forest : the Kluane project</title>
<author><firstname>Charles J.</firstname> <lastname>Krebs</lastname></author>
<imprint>Oxford ; New York : Oxford University Press, 2001</imprint>
<callnumber>QH 106.2 Y84 E36 2001</callnumber>
</book>

<book subject="chemistry">
<title>The weak hydrogen bond : in structural chemistry and biology</title>
<author><firstname>Gautam R.</firstname> <lastname>Desiraju</lastname></author>
<imprint>Oxford ; New York : Oxford University Press, c1999</imprint>
<callnumber>QD 461 D44 1999</callnumber>
</book>
```

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Address  C:\Documents and Settings\gilmour\My Documents\lita\ex\nbwf.xml

Go

Links »

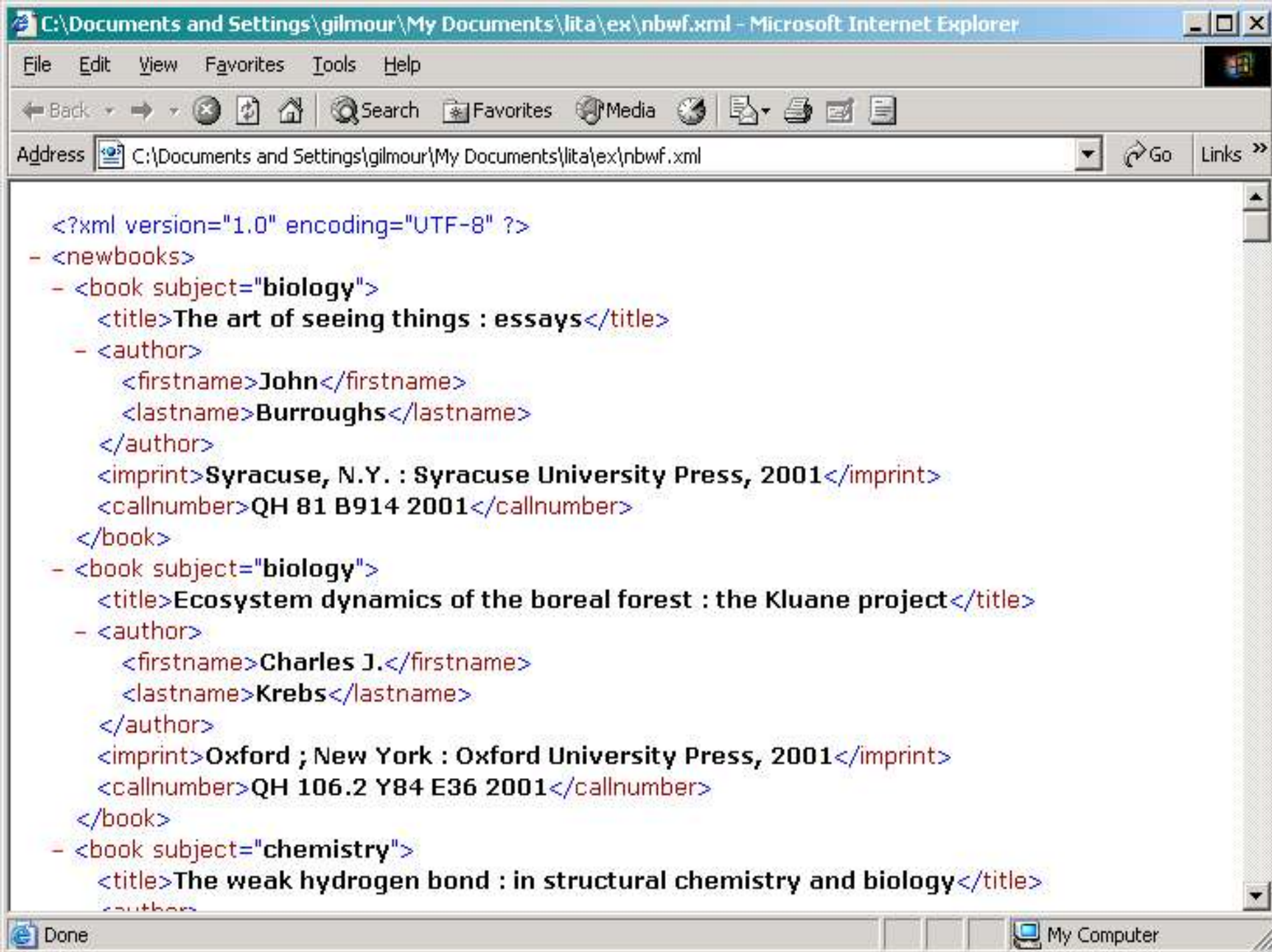
The XML page cannot be displayed

Cannot view XML input using XSL style sheet. Please correct the error and then click the [Refresh](#) button, or try again later.

End tag 'book' does not match the start tag 'title'. Error processing resource 'file:///C:/Documents and Settings/gilmour/My Documents/lita/ex/nbwf.xml'. Line 8, Position 3

</book>

--^



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Back Forward Stop Reload Home Search Favorites Media Print Mail

Address http://www.albany.edu/~gilmr/xml4lita/newbooks/nb_simple.xml

Go Links

All the New Books

A Really Long List

John Burroughs. *The art of seeing things : essays*. Syracuse, N.Y. : Syracuse University Press, 2001.

QH 81 B914 2001

Charles J. Krebs. *Ecosystem dynamics of the boreal forest : the Khuane project*. Oxford ; New York : Oxford University Press, 2001.

QH 106.2 Y84 E36 2001

Gautam R. Desiraju. *The weak hydrogen bond : in structural chemistry and biology*. Oxford ; New York : Oxford University Press, c1999.

QD 461 D44 1999

File Edit View Favorites Tools Help

Back Forward Stop Reload Home Search Favorites Media Print Copy Paste

Address http://www.albany.edu/~gilmr/xml4lita/newbooks/nb_sortByLN.xml

Go Links

All the New Books, Sorted by Author's Last Name

Aboul-Enein, Hassan Y.. *Quality and reliability in analytical chemistry*. Boca Raton : CRC Press, c2001.

[QD 75.4 Q34 A26 2001](#)

Almekinders, Conny. *Encouraging diversity : the conservation and development of plant genetic resources*. London : Intermediate Technology, 2000.

[QK 981 A46X 2000](#)

Andrews, Gregory R.. *Foundations of multithreaded, parallel, and distributed programming*. Reading, Mass. : Addison-Wesley, c2000.

[QA 76.58 A57 2000](#)

Andrews, Gregory R.. *Foundations of multithreaded, parallel, and distributed programming*. Reading, Mass. : Addison-Wesley, c2000.

Just the Biology Books

A List Demonstrating use of Filters in XSL

Almekinders, Conny. *Encouraging diversity : the conservation and development of plant genetic resources*. London : Intermediate Technology, 2000.

[QK 981 A46X 2000](#)

Asher, Jim. *The millennium atlas of butterflies in Britain and Ireland*. Oxford ; New York : Oxford University Press, 2001.

[QL 555 G7 M56 2001](#)

Bailey, Jill. *The Penguin dictionary of plant sciences*. London : Penguin books, c1999.

[QK 9 P45X 1999](#)

Bessette, Alan E.. *Wildflowers of Maine, New Hampshire, and Vermont in color*. Syracuse, N.Y. : Syracuse University Press, c2000.

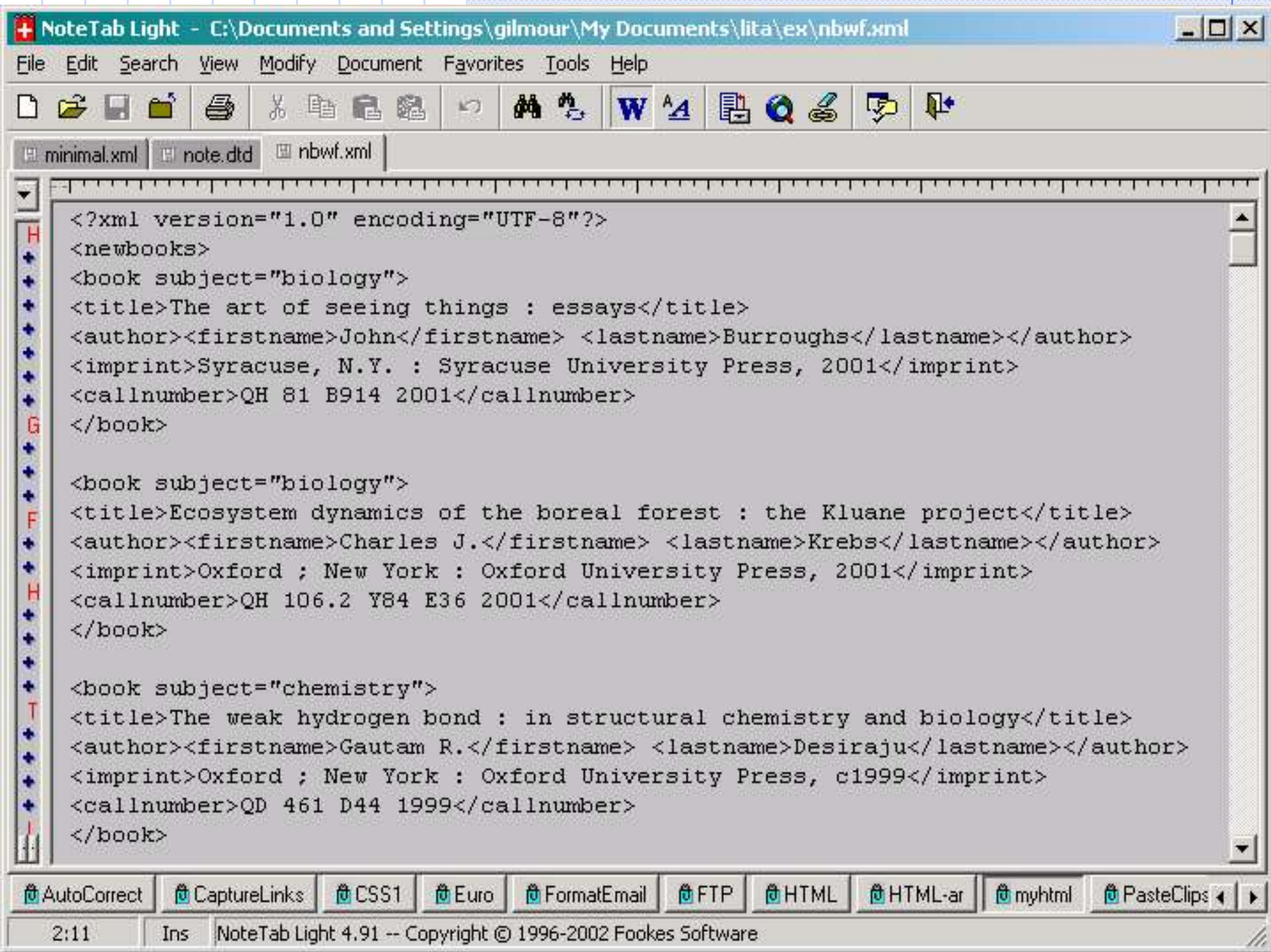
[QK 164 W56 2000](#)

Burroughs, John. *The art of seeing things : essays*. Syracuse, N.Y. : Syracuse University Press, 2001.

Just the Chemistry Books

This time, the list as an HTML table, with many attractive features added through the magic of Cascading Style Sheets

Aboul-Enein, Hassan Y.	<i>Quality and reliability in analytical chemistry</i>	Boca Raton : CRC Press, c2001	QD 75.4 Q34 A26 2001
Desiraju, Gautam R.	<i>The weak hydrogen bond : in structural chemistry and biology</i>	Oxford ; New York : Oxford University Press, c1999	QD 461 D44 1999
Eustathopoulos, Nicolas	<i>Wettability at high temperatures</i>	Amsterdam, [The Netherlands] : New York ; Oxford : Pergamon, c1999	QD 506 E78 1999
Jeffrey, George A.	<i>An introduction to hydrogen bonding</i>	New York : Oxford University Press, c1997	QD 461 J44 1997
Pyykkö, Pekka	<i>Relativistic theory of atoms and molecules III : a bibliography, 1993-1999</i>	Berlin ; London : Springer, c2000	QD 461 Z999 P88X 2000



```
<?xml version="1.0" encoding="UTF-8"?>
<newbooks>
<book subject="biology">
<title>The art of seeing things : essays</title>
<author><firstname>John</firstname> <lastname>Burroughs</lastname></author>
<imprint>Syracuse, N.Y. : Syracuse University Press, 2001</imprint>
<callnumber>QH 81 B914 2001</callnumber>
</book>

<book subject="biology">
<title>Ecosystem dynamics of the boreal forest : the Kluane project</title>
<author><firstname>Charles J.</firstname> <lastname>Krebs</lastname></author>
<imprint>Oxford ; New York : Oxford University Press, 2001</imprint>
<callnumber>QH 106.2 Y84 E36 2001</callnumber>
</book>

<book subject="chemistry">
<title>The weak hydrogen bond : in structural chemistry and biology</title>
<author><firstname>Gautam R.</firstname> <lastname>Desiraju</lastname></author>
<imprint>Oxford ; New York : Oxford University Press, c1999</imprint>
<callnumber>QD 461 D44 1999</callnumber>
</book>
```

III. Customizing XML

DTDs and Schemas

Simple list document

```
<ul>
```

```
<li>one</li>
```

```
<li>two</li>
```

```
</ul>
```

Generic Element Declaration

```
<!ELEMENT elementName  
elementContentModel>
```

ul Element Declaration

```
<!ELEMENT ul (li+)>
```


"List" DTD and Instance

```
<!ELEMENT ul (li+)>
```

```
<!ELEMENT li (#PCDATA)>
```

```
<ul>
```

```
<li>milk</li>
```

```
<li>bread</li>
```

```
</ul>
```

List with DOCTYPE reference

```
<?xml version="1.0"?>  
<!DOCTYPE ul SYSTEM "list.dtd">  
<ul>  
<li>milk</li>  
<li>bread</li>  
</ul>
```

List with included DTD

```
<?xml version="1.0"?>
<!DOCTYPE ul [
  <!ELEMENT ul (li+)>
  <!ELEMENT li (#PCDATA)>
]>
<ul>
  <li>milk</li>
  <li>bread</li>
</ul>
```

Generic Element Declaration

```
<!ELEMENT elementName  
elementContentModel>
```

Sequence of Children

<!ELEMENT address (street,
city, state, zip)>

Numeric Indicators

+	one or more	required, repeatable
*	zero or more	optional, repeatable
?	zero or one	optional, non-repeatable

Choice of Possible Children

<!ELEMENT spouse
(husband | wife)>

Complex Content

```
<!ELEMENT person (name,  
address, job*, (husband | wife)?,  
child*)>
```


EMPTY & ANY

<!ELEMENT vague ANY>

<!ELEMENT void EMPTY>

Mixed Content

<!ELEMENT paragraph
(#PCDATA | italic | bold)*>

Presentational Paragraph

<paragraph> My object in coming here was to see the great beds of shells, which are elevated some yards above the level of the sea. They nearly all consist of one species of <italic>Erycina</italic>; and these shells at the present day live together in great numbers, on the sandy flats.</paragraph>

Generic Attribute Declaration

```
<!ATTLIST elementName  
attributeName type "default value">
```

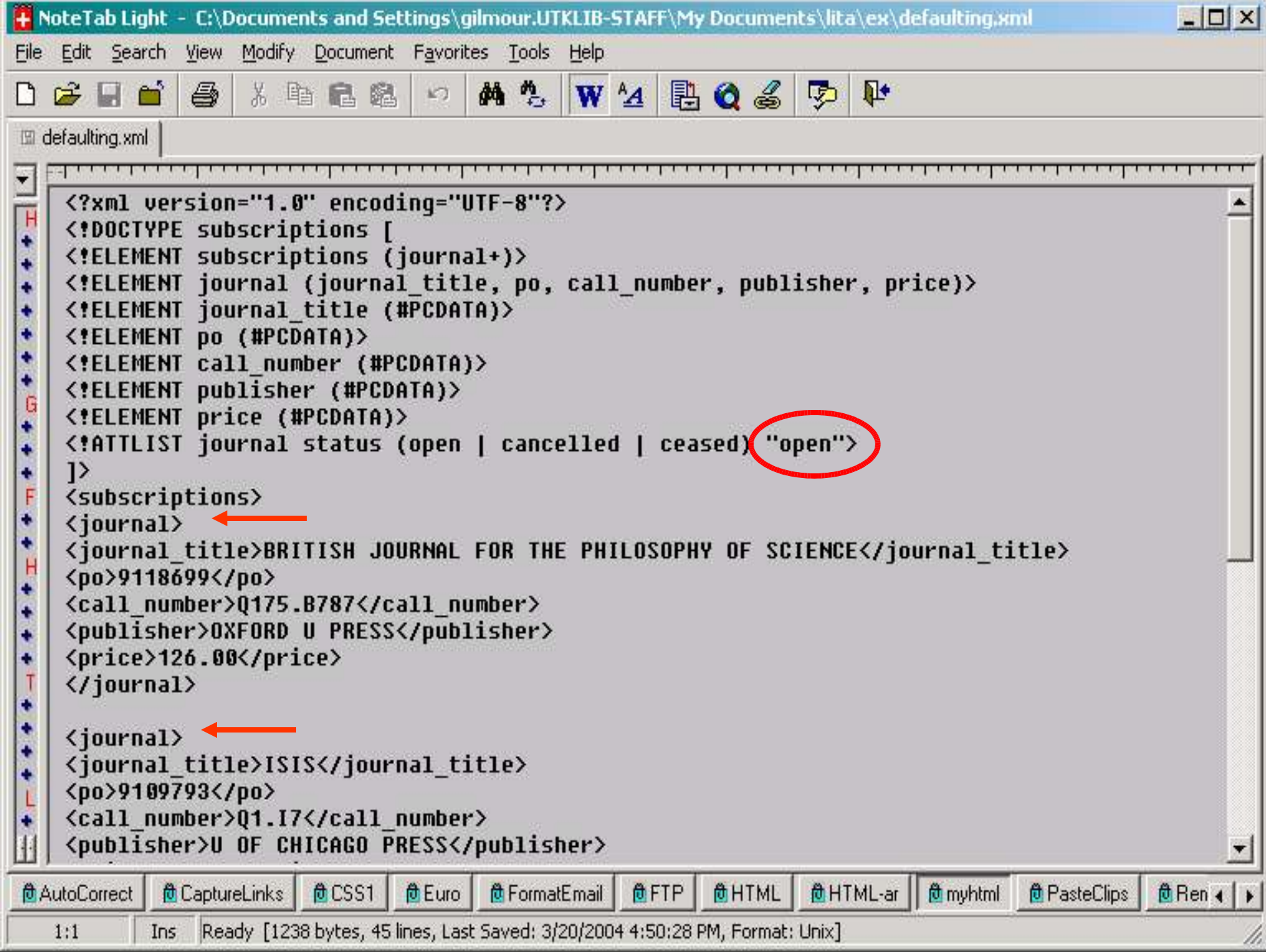
Simple CDATA attribute

<!ATTLIST webpage url CDATA
#REQUIRED>

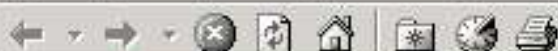
Enumerated Values

<!ATTLIST journal

status (open | cancelled | ceased)
"open">



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Go

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE subscriptions (View Source for full doctype...)>
- <subscriptions>
-   <journal status="open"> ←
      <journal_title>BRITISH JOURNAL FOR THE PHILOSOPHY OF SCIENCE</journal_title>
      <po>9118699</po>
      <call_number>Q175.B787</call_number>
      <publisher>OXFORD U PRESS</publisher>
      <price>126.00</price>
    </journal>
-   <journal status="open"> ←
      <journal_title>ISIS</journal_title>
      <po>9109793</po>
      <call_number>Q1.I7</call_number>
      <publisher>U OF CHICAGO PRESS</publisher>
      <price>236.00</price>
    </journal>
-   <journal status="cancelled">
      <journal_title>CHEMOSPHERE</journal_title>
      <po>9102017</po>
      <call_number>QH540.C48</call_number>
      <publisher>PERGAMON</publisher>
      <price>3897.43</price>
    </journal>
```


Multiple Attributes

<!ATTLIST journal

issn NMTOKEN #REQUIRED

coden NMTOKEN #IMPLIED>

How Attributes differ from Elements

- ◆ allow primitive data typing
- ◆ not ordered
- ◆ usually less verbose
- ◆ do not allow for hierarchical content
- ◆ attributes not repeatable

St. Laurent, Simon. 2000. *XML Elements of Style*.
New York: McGraw-Hill.

Generic Entity Declaration


`<!ENTITY entityName "what will
replace the entity reference">`

Text Replacement Entity

<!ENTITY spe "M. E. Grenander
Department of Special Collections
and Archives">

unix.cas.utk.edu - utunix - SSH Secure Shell

File Edit View Window Help

Quick ConnectProfiles

Buffers Files Tools Edit Search Help

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE events [
<!ELEMENT events (event+)>
<!ELEMENT event (event_name, location, date, time)>
<!ATTLIST event type (film | speaker | recital | other) #REQUIRED>
<!ELEMENT event_name (#PCDATA)>
<!ELEMENT location (#PCDATA)>
<!ELEMENT date (#PCDATA)>
<!ELEMENT time (#PCDATA)>
<!ENTITY agvet "Webster Pendergrass Agriculture-Veterinary Medicine Library">
]>
<events>

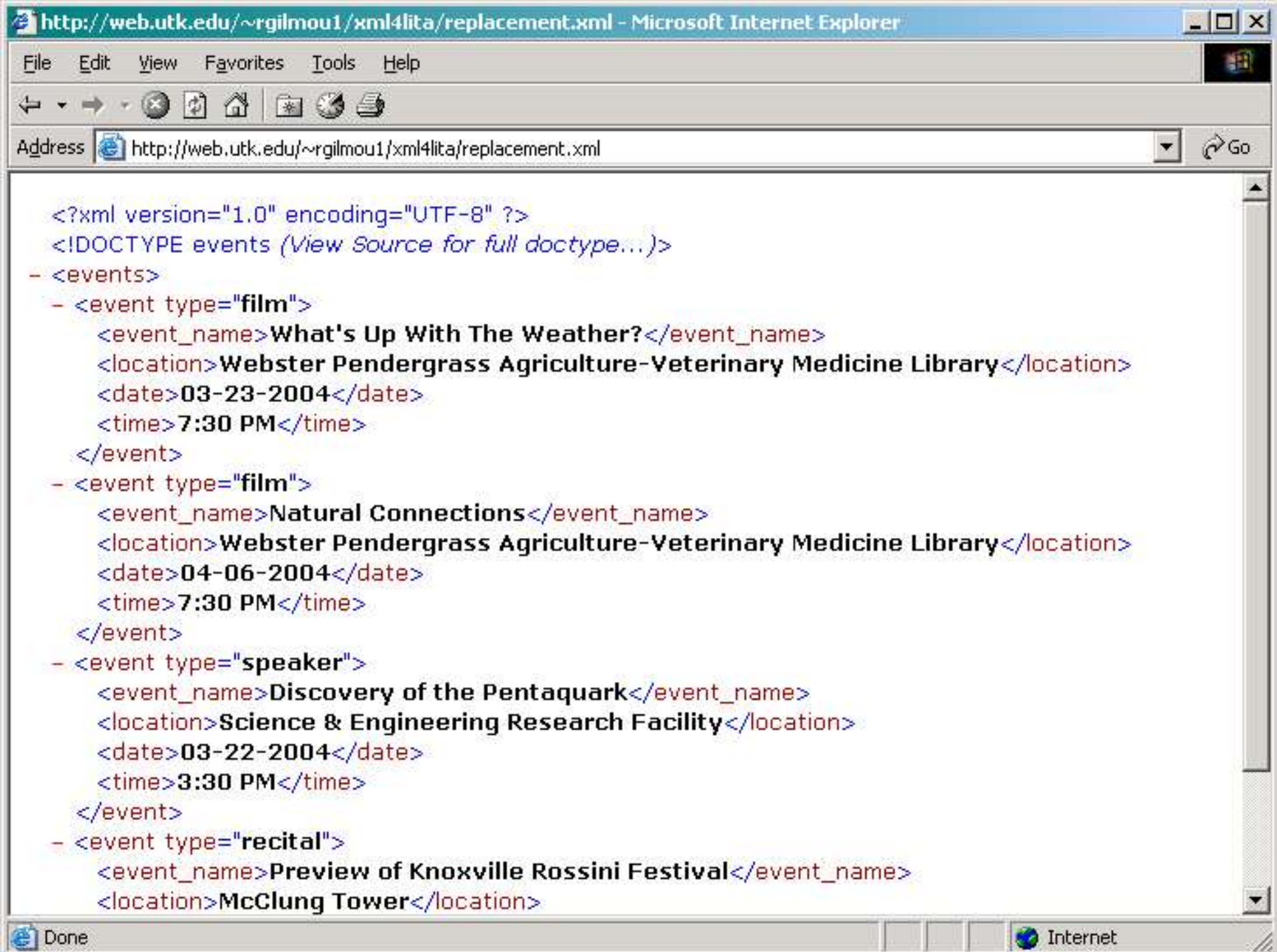
<event type="film">
<event_name>What's Up With The Weather?</event_name>
<location>&agvet;</location>
<date>03-29-2004</date>
<time>7:30 PM</time>
</event>

<event type="film">
<event_name>Natural Connections</event_name>
```

-----Emacs: replacement.xml (Text Abbrev)--L1--Top-----

For information about the GNU Project and its goals, type f1 C-p.

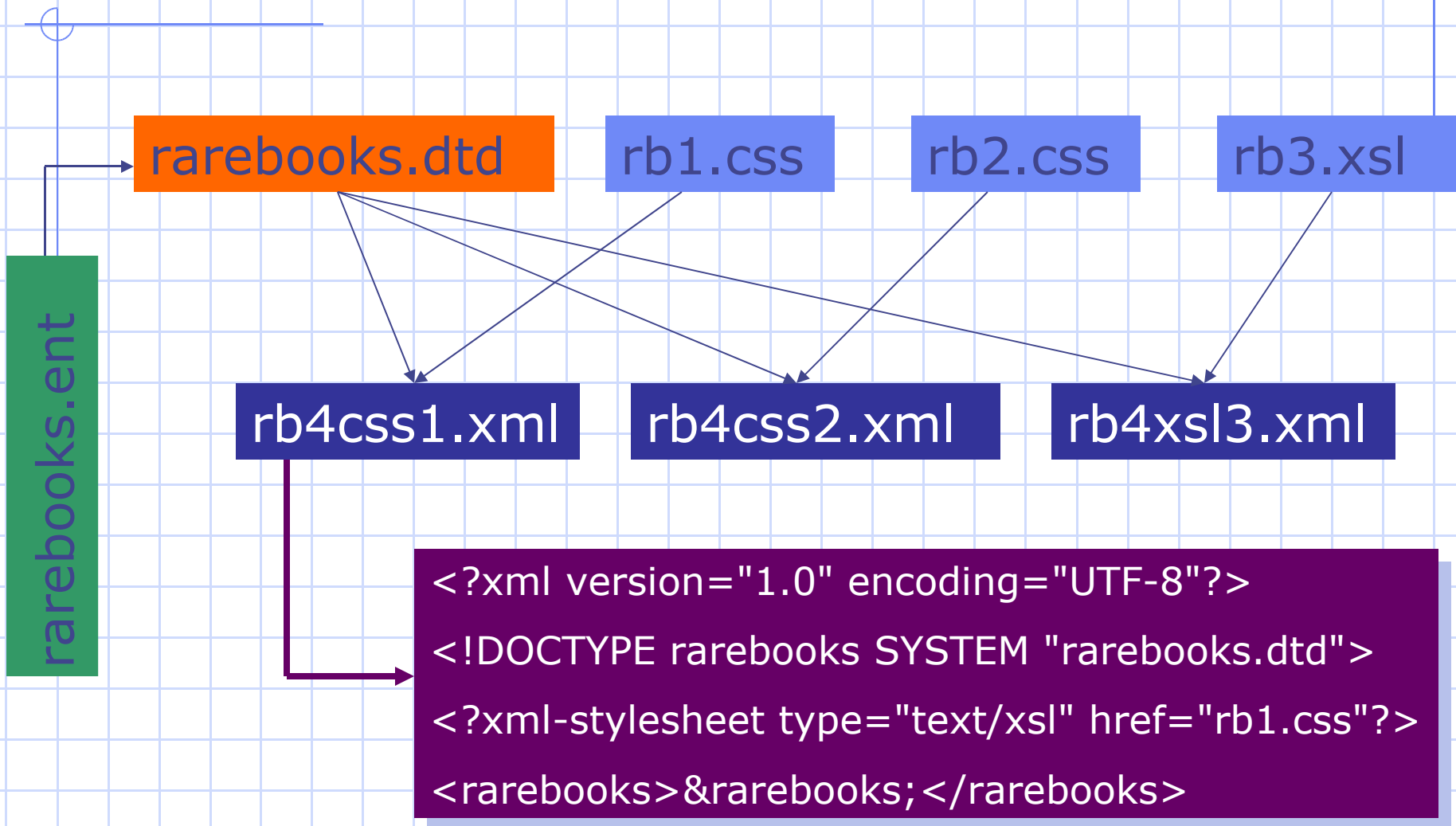
Connected to unix.cas.utk.eduSSH2 - aes128-cbc - hmac-md5 - none80x25NUM



Including a File as an Entity

```
<!ENTITY warAndPeace  
SYSTEM "warAndPeace.txt">
```

"Minidocument" Trick



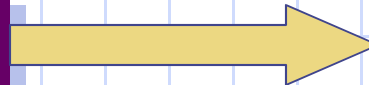
Automatic Special Characters Entities

&	&
<	<
>	>
'	'
"	"

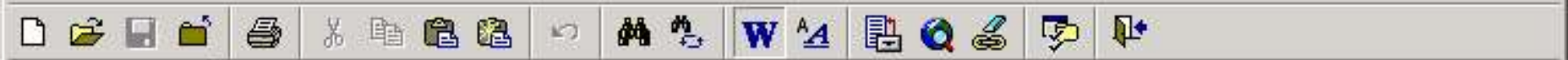
Declaring a Special Character

```
<!ENTITY eacute "&#233;">
```

é



é



defaulting.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE subscriptions [
<!ELEMENT subscriptions (journal+)>
<!ELEMENT journal (journal_title, po, call_number, publisher, price)>
<!ELEMENT journal_title (#PCDATA)>
<!ELEMENT po (#PCDATA)>
<!ELEMENT call_number (#PCDATA)>
<!ELEMENT publisher (#PCDATA)>
<!ELEMENT price (#PCDATA)>
<!ATTLIST journal status (open | cancelled | ceased) "open">
]>
<subscriptions>
<journal>
<journal_title>BRITISH JOURNAL FOR THE PHILOSOPHY OF SCIENCE</journal_title>
<po>9118699</po>
<call_number>Q175.B787</call_number>
<publisher>OXFORD U PRESS</publisher>
<price>126.00</price>
</journal>

<journal>
<journal_title>ISIS</journal_title>
<po>9109793</po>
<call_number>Q1.I7</call_number>
<publisher>U OF CHICAGO PRESS</publisher>
<price>236.00</price>
```

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Go

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE subscriptions (View Source for full doctype...)>
- <subscriptions>
-   <journal status="open">
      <journal_title>BRITISH JOURNAL FOR THE PHILOSOPHY OF SCIENCE</journal_title>
      <po>9118699</po>
      <call_number>Q175.B787</call_number>
      <publisher>OXFORD U PRESS</publisher>
      <price>126.00</price>
    </journal>
-   <journal status="open">
      <journal_title>ISIS</journal_title>
      <po>9109793</po>
      <call_number>Q1.I7</call_number>
      <publisher>U OF CHICAGO PRESS</publisher>
      <price>236.00</price>
    </journal>
-   <journal status="cancelled">
      <journal_title>CHEMOSPHERE</journal_title>
      <po>9102017</po>
      <call_number>QH540.C48</call_number>
      <publisher>PERGAMON</publisher>
      <price>3897.43</price>
    </journal>
```


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Go

```

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE subscriptions (View Source for full doctype...)>
- <subscriptions>
- <journal status="open">
  <journal_title>BRITISH JOURNAL FOR THE PHILOSOPHY OF SCIENCE</journal_title>
  <po>9118699</po>
  <call_number>Q175.B787</call_number>
  <publisher>OXFORD U PRESS</publisher>
  <price>126.00</price>
</journal>
- <journal status="open">
  <journal_title>ISIS</journal_title>
  <po>9109793</po>
  <call_number>Q1.17</call_number>
  <publisher>U OF CHICAGO PRESS</publisher>
  <price>236.00</price>
</journal>
- <journal status="cancelled">
  <journal_title>CHEMOSPHERE</journal_title>
  <po>9102017</po>
  <call_number>QH540.C48</call_number>
  <publisher>PERGAMON</publisher>
  <price>3897.43</price>
</journal>
- <journal status="open">
  <journal_title>JOURNAL OF ELECTRON MICROSCOPY</journal_title>
  <po>9109915</po>
  <call_number>QC373.E4J6</call_number>
  <publisher>OXFORD U PRESS</publisher>
  <price>369.07</price>
</journal>
</subscriptions>

```

Back

Forward

Save Background As...

Set as Background

Copy Background

Set as Desktop Item...

Select All

Paste

Create Shortcut

Add to Favorites...

View Source

Encoding

Print

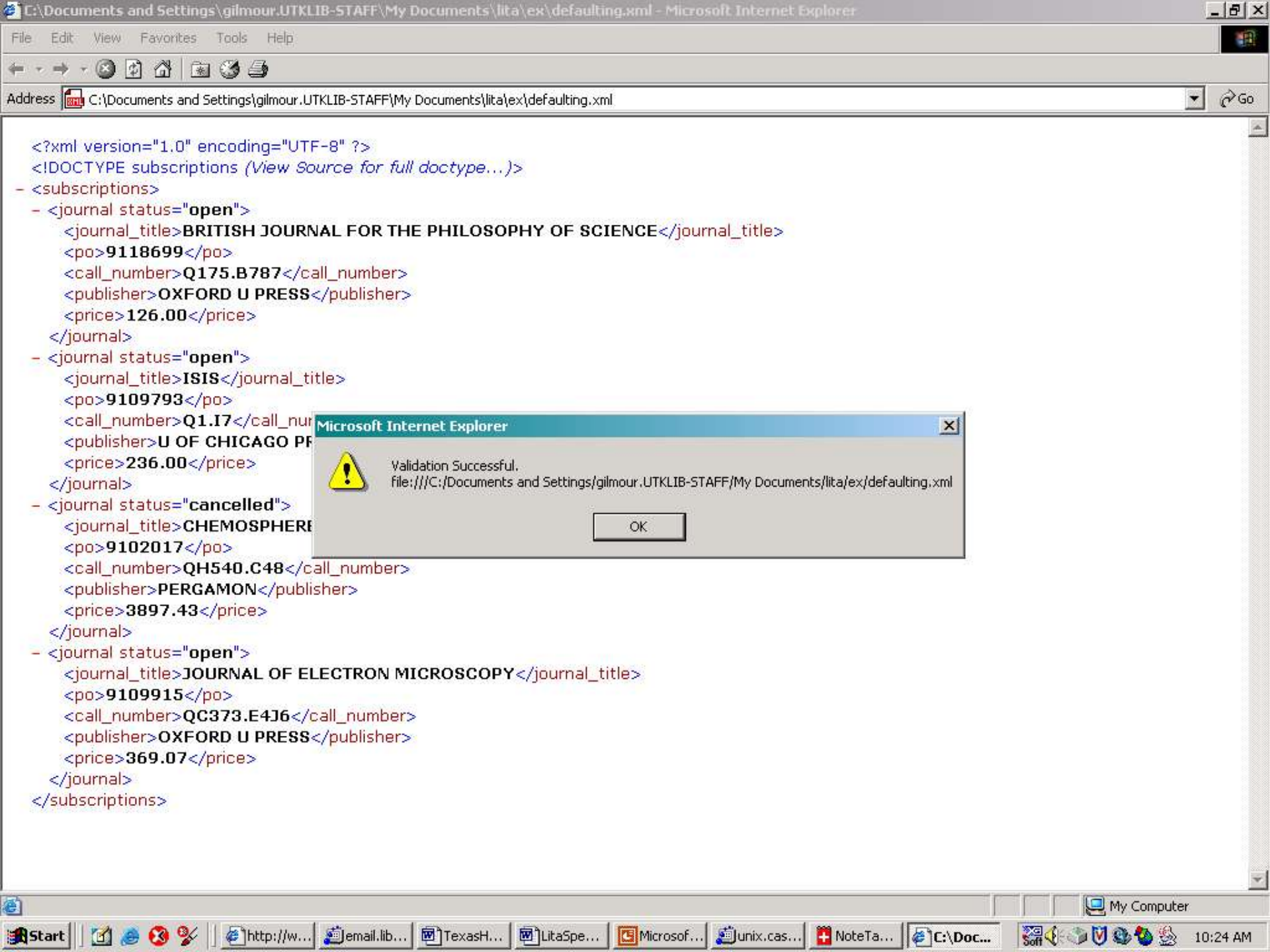
Refresh

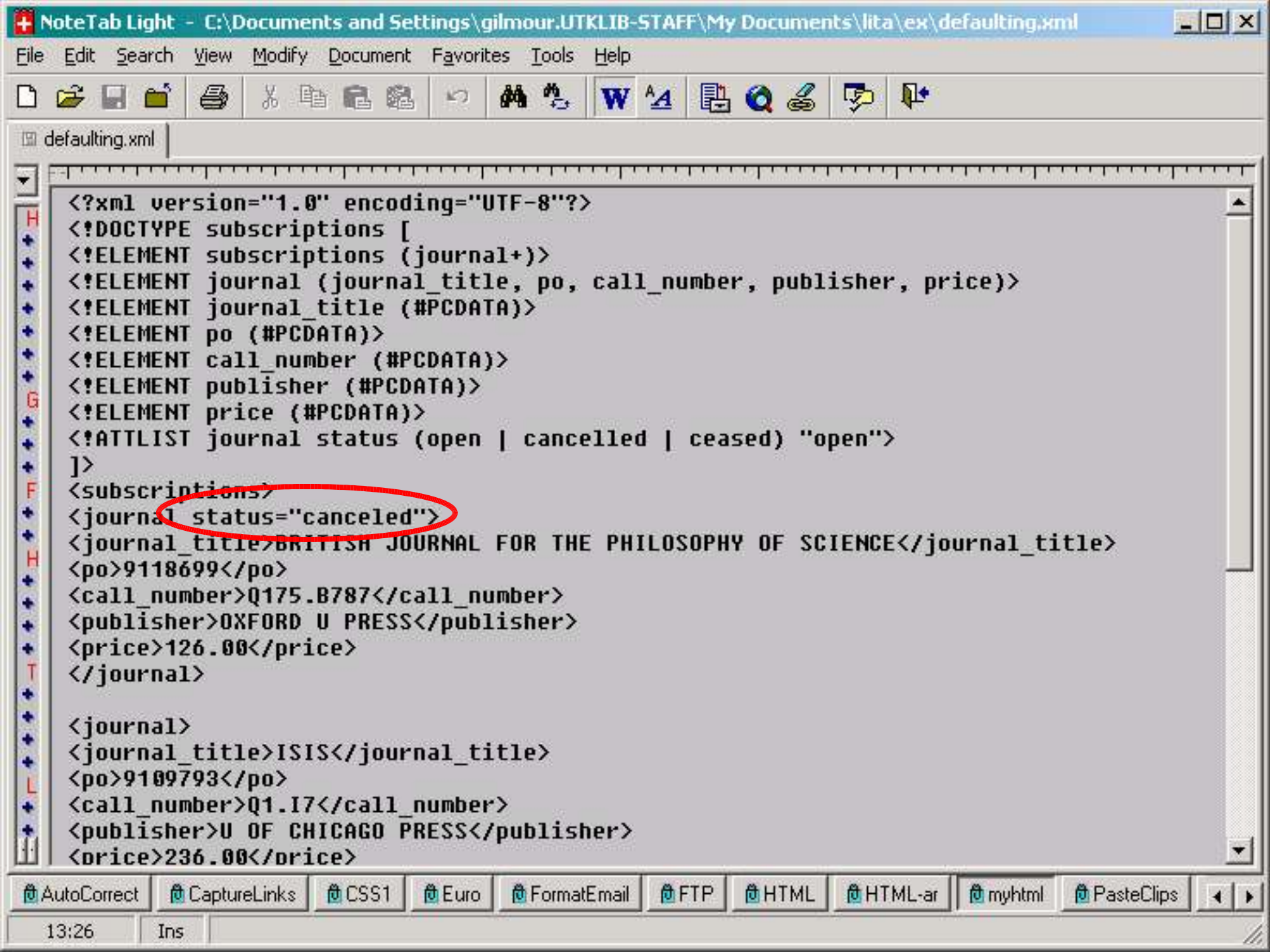
Edit with XML Spy

Validate XML

View XSL Output

Properties

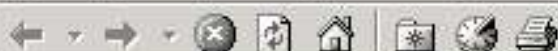




```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE subscriptions [
<!ELEMENT subscriptions (journal+)>
<!ELEMENT journal (journal_title, po, call_number, publisher, price)>
<!ELEMENT journal_title (#PCDATA)>
<!ELEMENT po (#PCDATA)>
<!ELEMENT call_number (#PCDATA)>
<!ELEMENT publisher (#PCDATA)>
<!ELEMENT price (#PCDATA)>
<!ATTLIST journal status (open | cancelled | ceased) "open">
]>
<subscriptions>
<journal status="canceled">
<journal_title>BRITISH JOURNAL FOR THE PHILOSOPHY OF SCIENCE</journal_title>
<po>9118699</po>
<call_number>Q175.B787</call_number>
<publisher>OXFORD U PRESS</publisher>
<price>126.00</price>
</journal>

<journal>
<journal_title>ISIS</journal_title>
<po>9109793</po>
<call_number>Q1.I7</call_number>
<publisher>U OF CHICAGO PRESS</publisher>
<price>236.00</price>
```

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Address  C:\Documents and Settings\gilmour.UTKLIB-STAFF\My Documents\lita\ex\defaulting.xml

Go

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE subscriptions (View Source for full doctype...)>
- <subscriptions>
  - <journal status="canceled">
    <journal_title>BRITISH JOURNAL FOR THE PHILOSOPHY OF SCIENCE</journal_title>
    <po>9118699</po>
    <call_number>Q17.
    <publisher>OXFOR
    <price>126.00</pr
  </journal>
  - <journal status="ope
    <journal_title>ISIS
    <po>9109793</po>
    <call_number>Q1.I7</call_number>
    <publisher>U OF CHICAGO PRESS</publisher>
    <price>236.00</price>
  </journal>
  - <journal status="cancelled">
    <journal_title>CHEMOSPHERE</journal_title>
    <po>9102017</po>
    <call_number>QH540.C48</call_number>
    <publisher>PERGAMON</publisher>
    <price>3897.43</price>
  </journal>
```



IV. XML Vocabularies of Interest to Libraries

Tennant's Categories of XML Use

- ◆ Catalog Records
- ◆ Interlibrary Loan
- ◆ Cataloging and Indexing
- ◆ Building Collections
- ◆ Databases
- ◆ Data Migration
- ◆ Systems Interoperability



XHTML™ 1.0 The Extensible HyperText Markup Language (Second Edition)

A Reformulation of HTML 4 in XML 1.0

W3C Recommendation 26 January 2000, revised 1 August 2002

This version:

<http://www.w3.org/TR/2002/REC-xhtml1-20020801>

Latest version:

<http://www.w3.org/TR/xhtml1>

Previous version:

<http://www.w3.org/TR/2000/REC-xhtml1-20000126>

Diff-marked version:

<http://www.w3.org/TR/2002/REC-xhtml1-20020801/xhtml1-diff.html>

Authors:

See [acknowledgments](#).

MARCXML

MARC 21 XML Schema

Official Web Site

The Library of Congress' Network Development and MARC Standards Office is developing a framework for working with MARC data in a XML environment. This framework is intended to be flexible and extensible to allow users to work with MARC data in ways specific to their needs. The framework itself includes many components such as schemas, stylesheets, and software tools.

MARC XML Architecture

- [MARC XML Design Considerations](#)
- [MARC XML Architecture](#)
- [MARC XML Uses and Features](#)

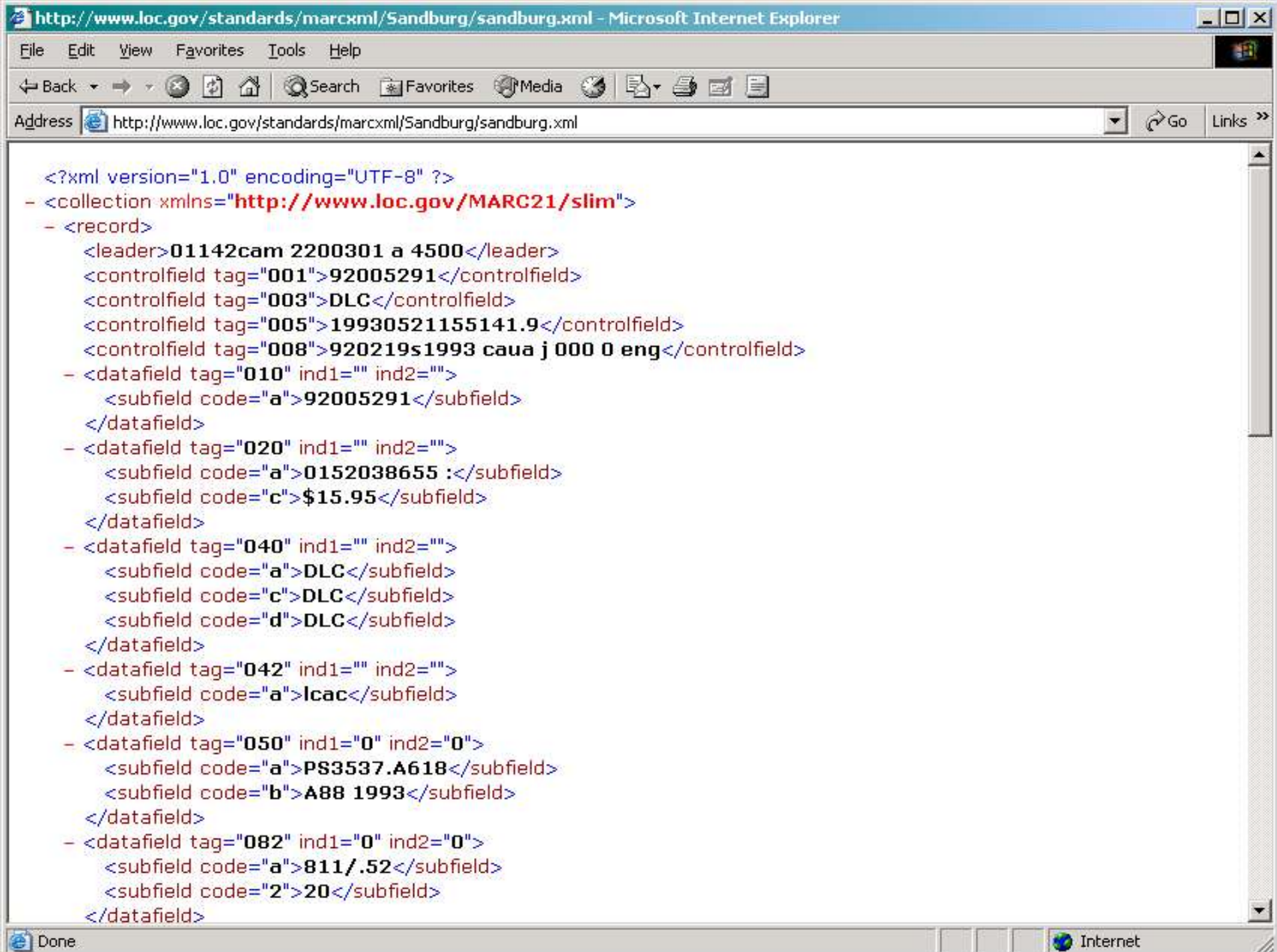
MARC XML Schema & Documentation

- [MARC XML Schema](#)
- [MARC XML Illustrated](#)

MARC XML Example Documents

MARCXML 260 Field

```
<datafield tag="260" ind1=" " ind2=" ">  
  <subfield code="a">San Diego :</subfield>  
  <subfield code="b">Harcourt Brace  
Jovanovich,</subfield>  
  <subfield code="c">c1993.</subfield>  
</datafield>
```



Metadata Object Description Schema

Official Web Site

The Library of Congress' Network Development and MARC Standards Office, with interested experts, has developed a schema for a bibliographic element set that may be used for a variety of purposes, and particularly for library applications. As an XML schema, the "Metadata Object Description Schema" (MODS) is intended to be able to carry selected data from existing MARC 21 records as well as to enable the creation of original resource description records. It includes a subset of MARC fields and uses language-based tags rather than numeric ones, in some cases regrouping elements from the MARC 21 bibliographic format. MODS is expressed using the [XML schema language](#) of the [World Wide Web Consortium](#). The standard is maintained by the [Network Development and MARC Standards Office](#) of the Library of Congress with input from users.

[MODS schema version 3.0](#) is now available. A [list of changes](#) from version 2.0 that were applied is available.

MODS Schema, & Documentation

- MODS Version 3

MODS transformation

```
<originInfo>
  <place>
    <code authority="marc">cau</code>
    <text>San Diego</text>
  </place>
  <publisher>Harcourt Brace Jovanovich</publisher>
  <dateIssued>c1993</dateIssued>
  <dateIssued encoding="marc">1993</dateIssued>
  <edition>1st ed.</edition>
  <issuance>monographic</issuance>
</originInfo>
```


http://www.loc.gov/standards/marcxml/schema/MARC21slim.xsd - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Copy Paste

Address http://www.loc.gov/standards/marcxml/schema/MARC21slim.xsd Go Links

```
<?xml version="1.0" ?>
- <xsd:schema targetNamespace="http://www.loc.gov/MARC21/slim"
  xmlns="http://www.loc.gov/MARC21/slim" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified" attributeFormDefault="unqualified" version="1.0" xml:lang="en">
- <xsd:annotation>
  <xsd:documentation>MARCXML: The MARC 21 XML Schema Prepared by Corey Keith May 21, 2002
    This schema supports XML markup of MARC21 records as specified in the MARC documentation
    (see www.loc.gov). It allows tags with alphabetic and subfield codes that are symbols, neither
    of which are as yet used in the MARC 21 communications formats, but are allowed by MARC 21
    for local data. The schema accommodates all types of MARC 21 records: bibliographic, holdings,
    bibliographic with embedded holdings, authority, classification, and community
    information.</xsd:documentation>
  </xsd:annotation>
  <xsd:import namespace="http://www.w3.org/XML/1998/namespace"
    schemaLocation="http://www.w3.org/2001/03/xml.xsd" />
- <xsd:element name="collection" type="collectionType" nillable="true" id="collection.e">
- <xsd:annotation>
  <xsd:documentation>collection is a top level container element for 0 or many
    records</xsd:documentation>
  </xsd:annotation>
</xsd:element>
- <xsd:element name="record" type="recordType" nillable="true" id="record.e">
- <xsd:annotation>
  <xsd:documentation>record is a top level container element for all of the field elements which
    compose the record</xsd:documentation>
  </xsd:annotation>
</xsd:element>
- <xsd:complexType name="collectionType" id="collection.ct">
- <xsd:sequence minOccurs="0" maxOccurs="unbounded">
  <xsd:element ref="record" />
</xsd:sequence>
</xsd:complexType>
</xsd:schema>
```

Done Internet



Medlane

XMLMARC

A Project of Lane Medical Library, Stanford University Medical Center

XMLMARC started as a program to convert MARC (Machine Readable Cataloging) records into XML. Initially, the XMLMARC web page functioned as the home page for the Medlane project and the XMLMARC software. With the development of a Medlane schema for library information (XOBIS), the Medlane project has grown beyond the scope of the XMLMARC page. As a result, it now has its own web site. If you are interested in learning more about XOBIS, the new Medlane XML schema for library information, viewing the "XML for libraries" bibliography, or finding out more about the Medlane project in general you should visit the [new Medlane project page](#).

Welcome to the XMLMARC page

XMLMARC and MARCUTL were designed for practical use by Lane Medical Library staff; they were also designed, however, with the hope that they might benefit others in the library community. Participation in the ongoing development and improvement of these tools by librarians, programmers, and library staff is strongly encouraged. If you are not sure of how you can help, feel free to ask the XMLMARC [mailing list](#) for ideas. If you do not like mailing lists, you may email Kevin (ksclarke@stanford.edu) directly.

News and Updates

09/30/2002

Refactoring XMLMARC to use the new Medlane MARC API (MedMARC) and MARCUTL Relax NG schema. An alpha should be available in a week.

xobis

The XML Organic Bibliographic Information Schema

There are many XML schemas available for modeling MARC data. Most take a literal approach, naming elements and attributes after their corresponding MARC fields, subfields, and indicators. Others represent only a small subset of the data libraries use to describe resources. XOBIS attempts to walk the middle path: describe the full set of library information, but reorganize this information into a structure that empowers the use of library data as just one more information resource available in the digital domain.

Note: These pages are best viewed with IE5 and higher, Netscape 7 or Mozilla 1.0.

Important links are:

Other Medlane Pages

- [Medlane Overview](#)
- [XMLMARC](#)
- [Medlane Bibliography](#)

Record Structure

- [ControlData](#)
- [Principal Element](#)
- [Relationships](#)

```
<?xml version="1.0" encoding="UTF-8" ?>
- <RecordList xmlns="http://medlane.stanford.edu/ns/xobis/1.0a">
- <Record>
- <ControlData>
- <ID>
  <Organization id="94Z1595L" substitute="Code">CSt-L</Organization>
  <Value>30689</Value>
</ID>
- <Actions>
- <Action>
  <Type set="Action Type">Converted</Type>
- <Time>
    <Year>2002</Year>
    <Month>10</Month>
    <Day>10</Day>
    <Hour>15</Hour>
    <Minute>21</Minute>
    <Second>06</Second>
  </Time>
</Action>
</Actions>
- <Types>
  <Type set="Record Type">Original</Type>
</Types>
</ControlData>
```



Encoded Archival Description Official Web Site

*Network Development & MARC Standards Office
Library of Congress*

Encoded Archival Description (EAD)

Official Web Site

The EAD Document Type Definition (DTD) is a standard for encoding archival finding aids using the Standard Generalized Markup Language (SGML). The standard is maintained in the [Network Development and MARC Standards Office](#) of the Library of Congress (LC) in partnership with the [Society of American Archivists](#).

General Information

- [Background Information on EAD](#)
- [Overview of the EAD Structure](#)
- [Design Principles for Enhancements to EAD](#)
- [2001 EAD DTD Revision Suggestions](#)
- EAD Listserv: [How to subscribe](#) | [List message archive](#)
- [EAD Sites on the World Wide Web](#)
- [Other Sites Related to EAD](#)



Text Encoding Initiative

Welcome to the TEI Website

News flash!

2nd Annual Members Meeting

Chicago, 11-12
October 2002

TEI P4 published

Initially launched in 1987, the TEI is an international and interdisciplinary standard that helps libraries, museums, publishers, and individual scholars represent all kinds of literary and linguistic texts for online research and teaching, using an encoding scheme that is maximally expressive and minimally obsolescent.

- **All about the TEI Consortium:** describes the organization and constitution of the TEI Consortium
- **How to participate:** provides information on how projects institutions and individuals can play an active part in development and maintenance of the standard
- **The TEI Guidelines:** the chief deliverable of the TEI project: detailed recommendations for the encoding of all kinds of textual material of all kinds in all languages from all times
- **TEI Tutorials:** introductory and advanced teaching materials, presentations, and user case



Metadata Encoding & Transmission Standard

Official Web Site

The METS schema is a standard for encoding descriptive, administrative, and structural metadata regarding objects within a digital library, expressed using the [XML schema language](#) of the [World Wide Web Consortium](#). The standard is maintained in the [Network Development and MARC Standards Office](#) of the Library of Congress, and is being developed as an initiative of the [Digital Library Federation](#).

News & Announcements

- o [Draft Rights Schema Ready for Review \(August 5, 2003\)](#)
- o [New Member Added to METS Editorial Board \(June 16, 2003\)](#)
- o [METS Editorial Board Endorses Extension Schemas for Use with METS \(June 15, 2003\)](#)

Upcoming Events

- o [Conference Calendar](#)
- o [METS Opening Day West United States April 8 - 9 2004 Stanford University](#)



Open Archives Initiative

[Home](#)[Documents](#)[Tools](#)[Community](#)[News](#)[Organization](#)

News from the OAI Community

- **[OCLC's XTCat available through OAI-PMH](#)**. The Experimental Thesis Catalog is now available for OAI-PMH v2 harvesting from baseURL <http://alcme.oclc.org/xtcat/servlet/OAIHandler>. (9/02).
- **[ARC available through SourceForge](#)**: The Digital Library Group in Old Dominion University is pleased to announce the availability of Arc through SourceForge (<http://sourceforge.net/projects/oaiarc/>). Arc is released under the NCSA Open Source License. Arc is a federated search service based on the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH).
- **[JISC Project RoMEO](#)**. The [JISC](#) has funded a one year project to investigate the rights issues surrounding the 'self-archiving' of research in the UK academic community under the OAI-PMH. (9/02)
- **[Institute of Physics Publishing adopts OAI technical framework](#)**. Dublin Core metadata records for e-journals are available via OAI-PMH. (8/02)
- **[OAI-PMH Version 2 Release](#)**. The [version 2](#) specification is now the production release. Included in

Read Core Documents

- [Harvesting Protocol \(version 2.0\)](#)
- [1.1 to 2.0 Migration Instructions](#)
- [Implementation Guidelines](#)
- [FAQ](#)

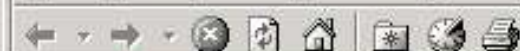
Join the OAI Community

[Join](#)**OAI General list**[Join](#)**OAI Implementers list**[Register](#)**as a data provider**[Submit](#)**a post to our web site**

Contact us:

openarchives@openarchives.org

V. Stylesheets for XML



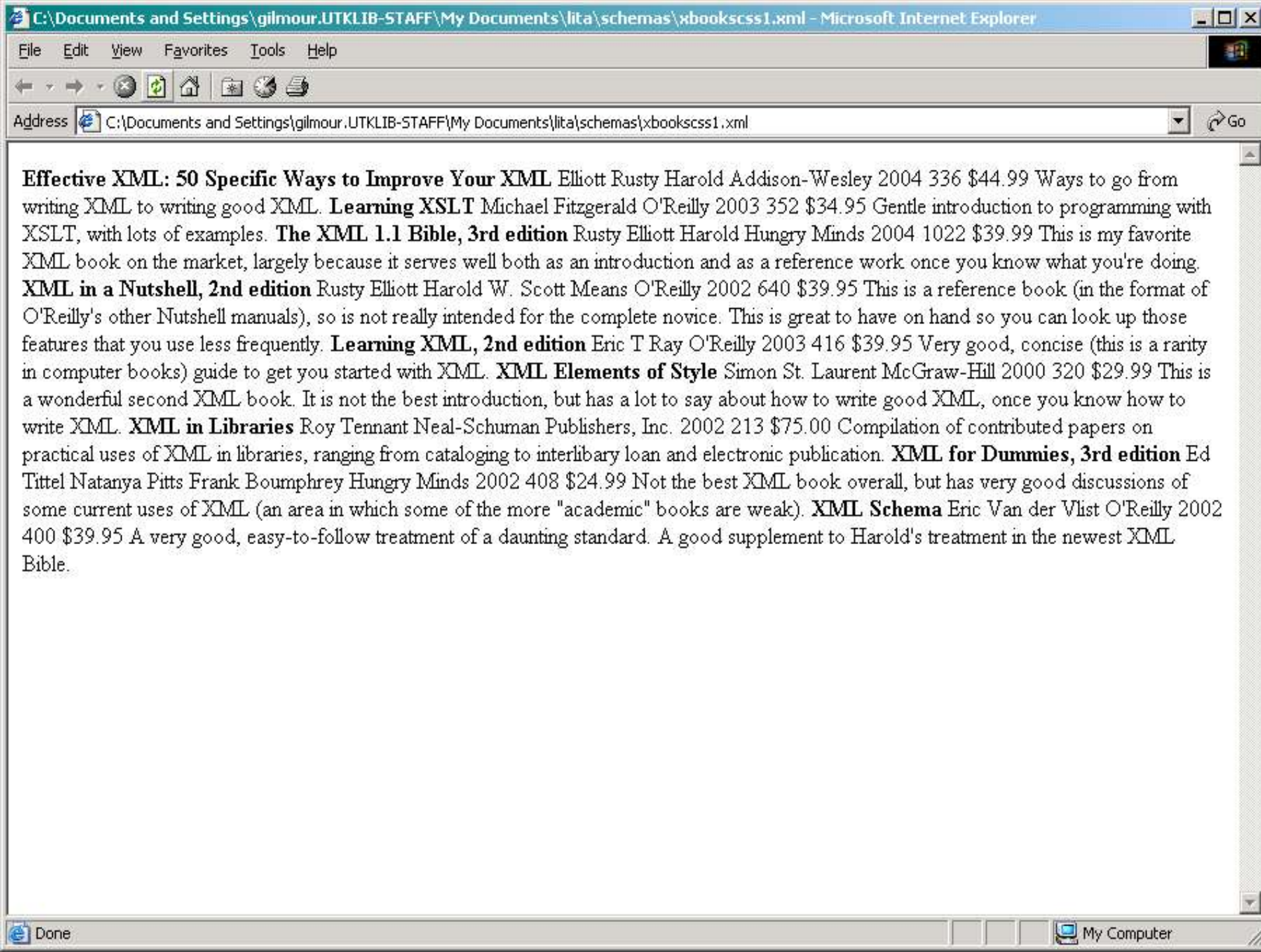
```
<?xml version="1.0" encoding="utf-8" ?>
- <bibliography xsi:noNamespaceSchemaLocation="bibliography.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
- <book isbn="0321150406">
  <title>Effective XML: 50 Specific Ways to Improve Your XML</title>
- <author>
    <first_name>Elliott</first_name>
    <middle_name>Rusty</middle_name>
    <last_name>Harold</last_name>
  </author>
  <publisher>Addison-Wesley</publisher>
  <year>2004</year>
  <pages>336</pages>
  <price>$44.99</price>
- <annotation>
  Ways to go from writing XML to writing
  <em>good</em>
  XML.
  </annotation>
</book>
- <book isbn="0596003277">
  <title>Learning XSLT</title>
- <author>
    <first_name>Michael</first_name>
    <last_name>Fitzgerald</last_name>
  </author>
  <publisher>O'Reilly</publisher>
```

Really simple CSS

```
title {font-weight:bold;}
```

Linking to a Stylesheet

```
<?xml-stylesheet type="text/css"  
href="bookstyle1.css"?>
```




```

title, author, publisher, annotation, year, price {
    margin-left: 2em;
    margin-right: 8em;
    display: block;
}

title {
    font-weight: bold;
    font-size: 1.2em;
    color: red;
    font-family: Verdana, Arial, sans-serif;
    margin-top: 1.5em;
}

author {
    font-style: italic;
    font-family: Garamond, serif;
}

pages {
    display: none;
}

em {
    font-style: italic;

```

Effective XML: 50 Specific Ways to Improve Your XML

Elliott Rusty Harold

Addison-Wesley

2004

\$44.99

Ways to go from writing XML to writing *good* XML.

Learning XSLT

Michael Fitzgerald

O'Reilly

2003

\$34.95

Gentle introduction to programming with XSLT, with lots of examples.

The XML 1.1 Bible, 3rd edition

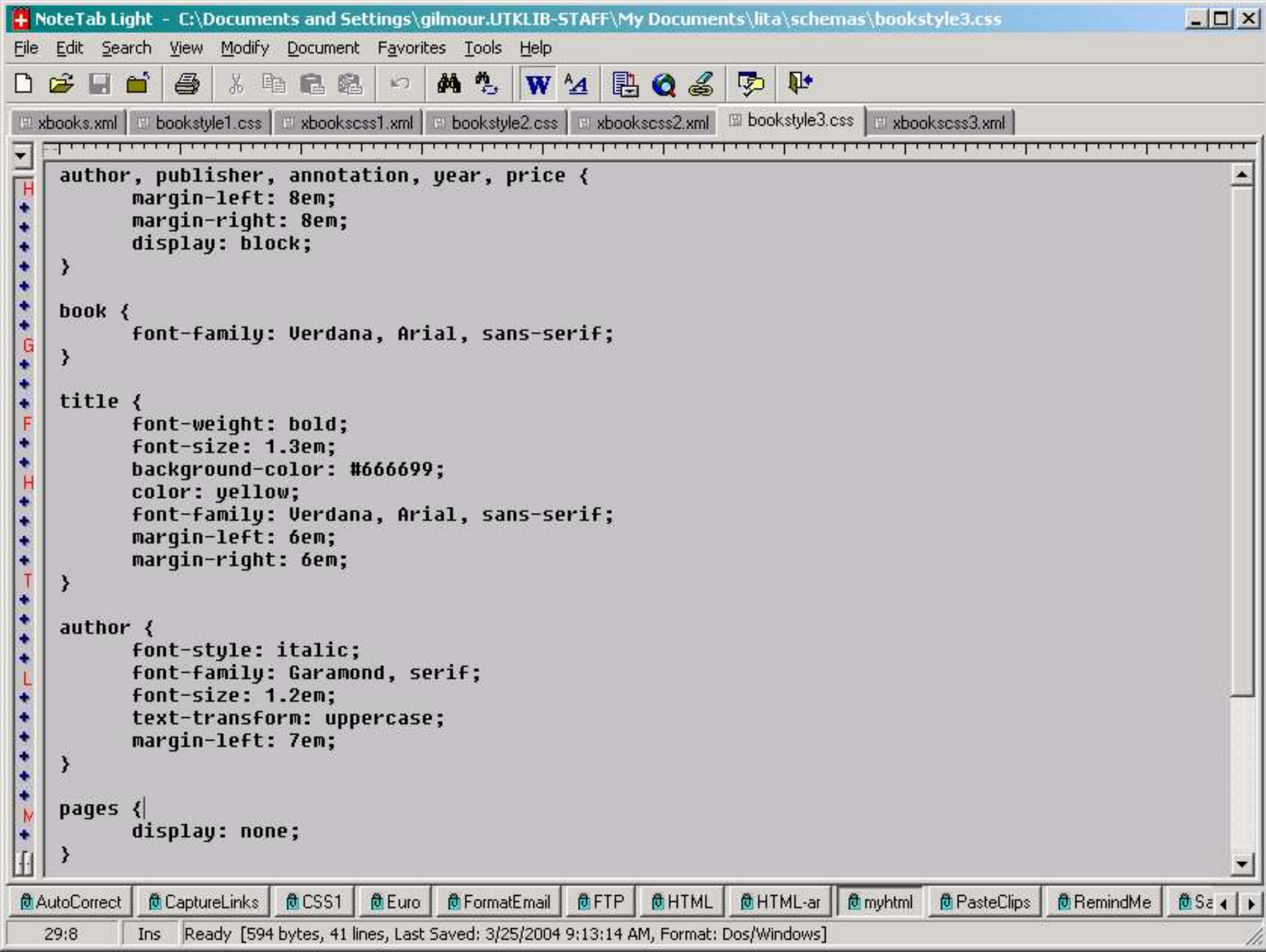
Rusty Elliott Harold

Hungry Minds

2004

\$39.99

This is my favorite XML book on the market, largely because it serves well both as an introduction and as a reference work once you know what you're doing.



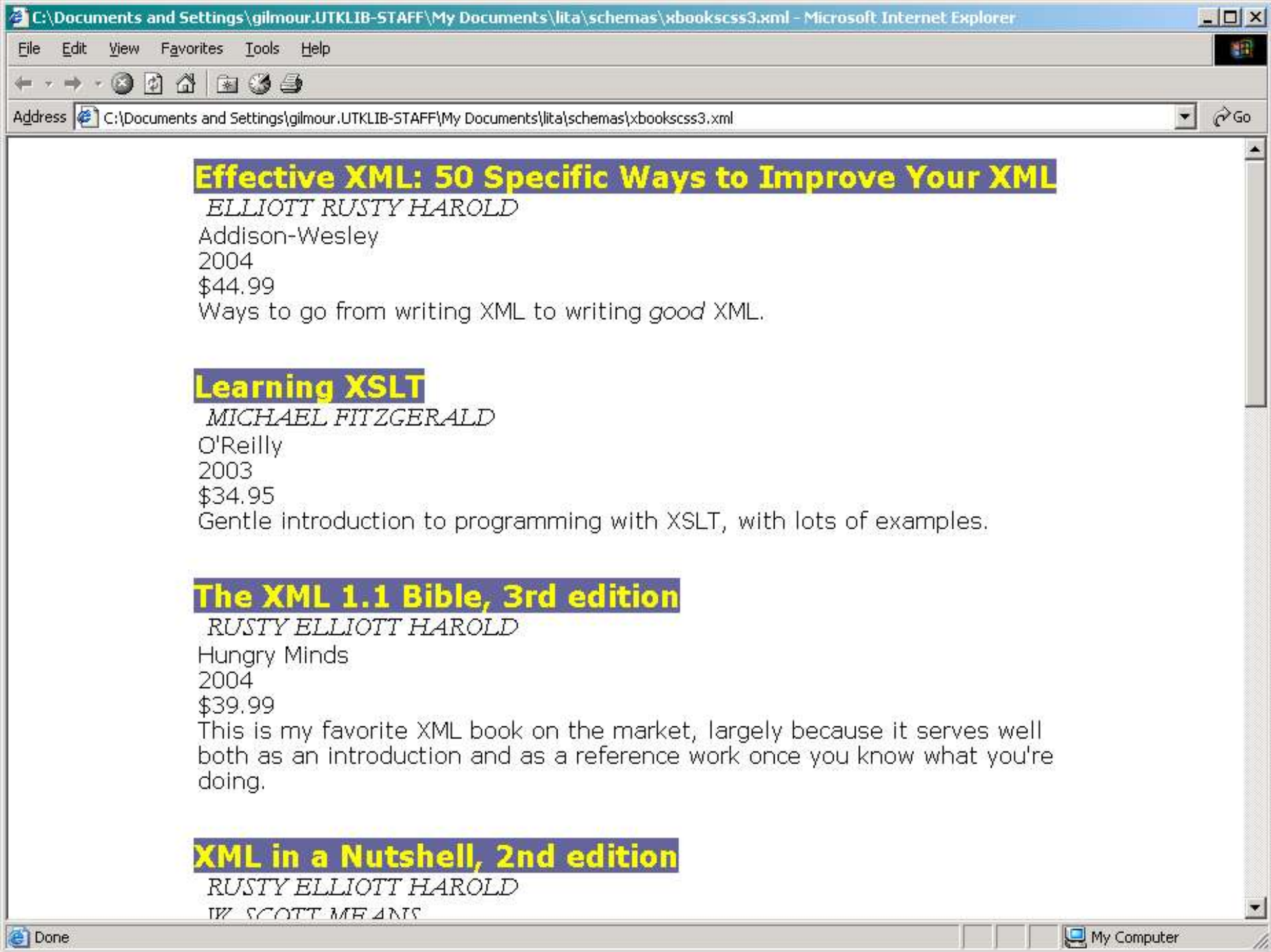
```
author, publisher, annotation, year, price {
    margin-left: 8em;
    margin-right: 8em;
    display: block;
}

book {
    font-family: Verdana, Arial, sans-serif;
}

title {
    font-weight: bold;
    font-size: 1.3em;
    background-color: #666699;
    color: yellow;
    font-family: Verdana, Arial, sans-serif;
    margin-left: 6em;
    margin-right: 6em;
}

author {
    font-style: italic;
    font-family: Garamond, serif;
    font-size: 1.2em;
    text-transform: uppercase;
    margin-left: 7em;
}

pages {
    display: none;
}
```

Effective XML: 50 Specific Ways to Improve Your XML

ELLIOTT RUSTY HAROLD

Addison-Wesley

2004

\$44.99

Ways to go from writing XML to writing good XML.

Learning XSLT

MICHAEL FITZGERALD

O'Reilly

2003

\$34.95

Gentle introduction to programming with XSLT, with lots of examples.

The XML 1.1 Bible, 3rd edition

RUSTY ELLIOTT HAROLD

Hungry Minds

2004

\$39.99

This is my favorite XML book on the market, largely because it serves well both as an introduction and as a reference work once you know what you're doing.

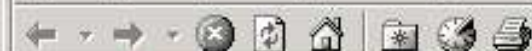
XML in a Nutshell, 2nd edition

RUSTY ELLIOTT HAROLD

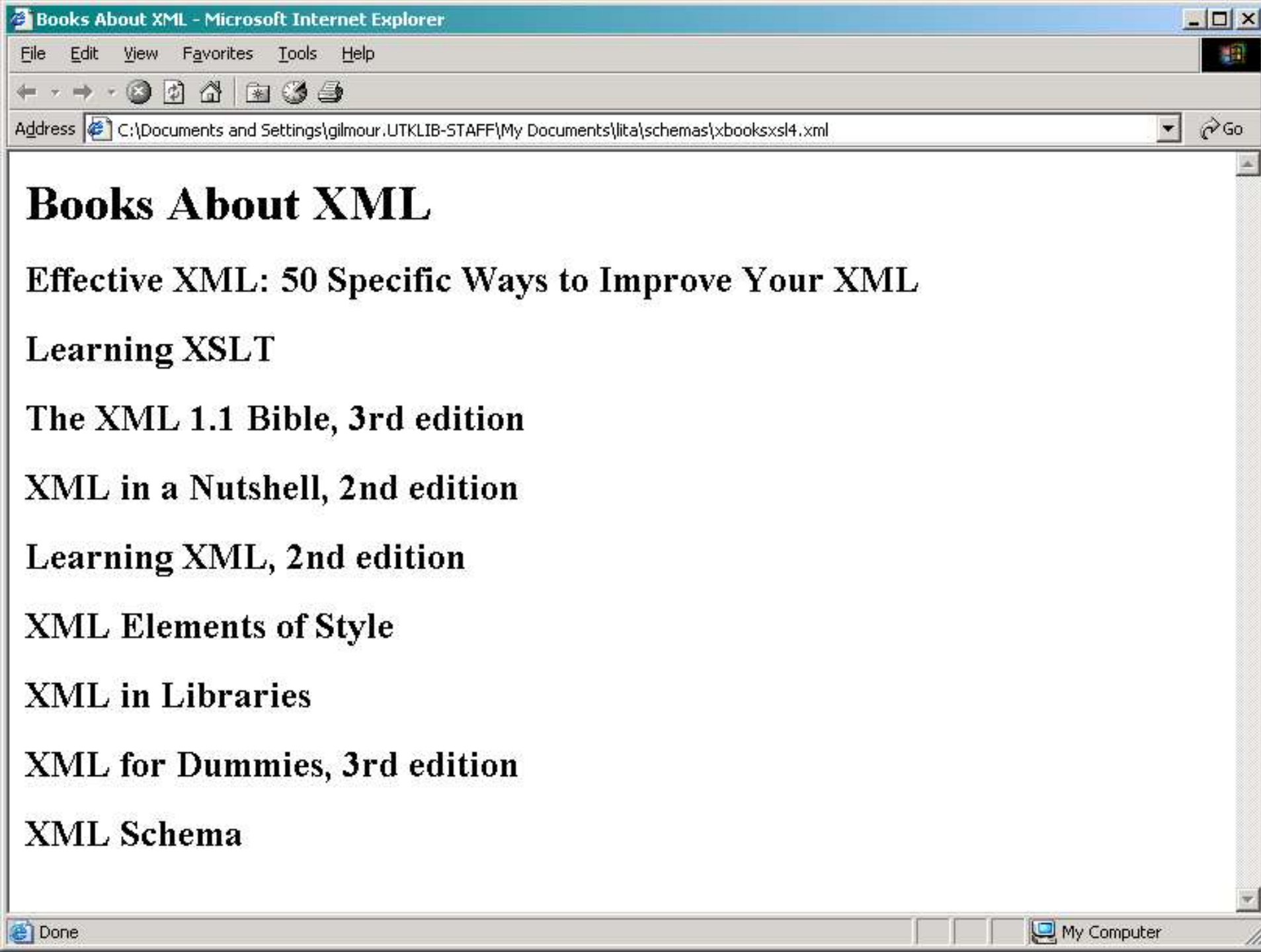
W. SCOTT MEANS

Parts of XSL

- ◆ XSLT: transforms XML to other formats
- ◆ XPath: expression language for specifying parts of XML documents
- ◆ XSLFO: addresses color, fonts, other style information



```
<?xml version="1.0" encoding="utf-8" ?>
- <xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
  <!-- First template: matches the document root and sets up the high-level HTML tags
  -->
  - <xsl:template match="/">
    - <html>
      - <head>
        <title>Books About XML</title>
      </head>
      - <body>
        <h1>Books About XML</h1>
        <xsl:apply-templates />
      </body>
    </html>
  </xsl:template>
  <!-- Second template: matches the book element and prints each book's title as an H2
  -->
  - <xsl:template match="book">
    - <h2>
      <xsl:value-of select="title" />
    </h2>
  </xsl:template>
</xsl:stylesheet>
```



Books About XML

Effective XML: 50 Specific Ways to Improve Your XML

Learning XSLT

The XML 1.1 Bible, 3rd edition

XML in a Nutshell, 2nd edition

Learning XML, 2nd edition

XML Elements of Style

XML in Libraries

XML for Dummies, 3rd edition

XML Schema



```
<?xml version="1.0" encoding="utf-8" ?>
```

xml declaration

```
- <xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/transform">
```

```
  <!-- First template: matches the document root and sets up the high-level HTML tags
```

```
-->
```

```
- <xsl:template match="/">
```

```
- <html>
```

```
- <head>
```

```
  <title>Books About XML</title>
```

```
</head>
```

```
- <body>
```

```
  <h1>Books About XML</h1>
```

```
  <xsl:apply-templates />
```

```
</body>
```

```
</html>
```

```
</xsl:template>
```

```
<!-- Second template: matches the book element and prints each book's title as an H2
```

```
-->
```

```
- <xsl:template match="book">
```

```
- <h2>
```

```
  <xsl:value-of select="title" />
```

```
</h2>
```

```
</xsl:template>
```

```
</xsl:stylesheet>
```

template 1

template 2

xsl:stylesheet

xsl:stylesheet element

```
<xsl:stylesheet version="1.0"  
xmlns:xsl="http://www.w3.org/1999/XSL/Transform"  
>
```

xsl namespace



A diagram consisting of a light blue rectangular box containing the text 'xsl namespace'. From the right side of this box, a horizontal line extends to the right, then turns 90 degrees upwards, ending in an arrowhead that points to the 'xmlns:xsl' attribute in the code snippet above.

First Template

```
<xsl:template match="/">
  <html>
    <head>
      <title>Books About XML</title>
    </head>
    <body>
      <h1>Books About XML</h1>
      <xsl:apply-templates/>
    </body>
  </html>
</xsl:template>
```

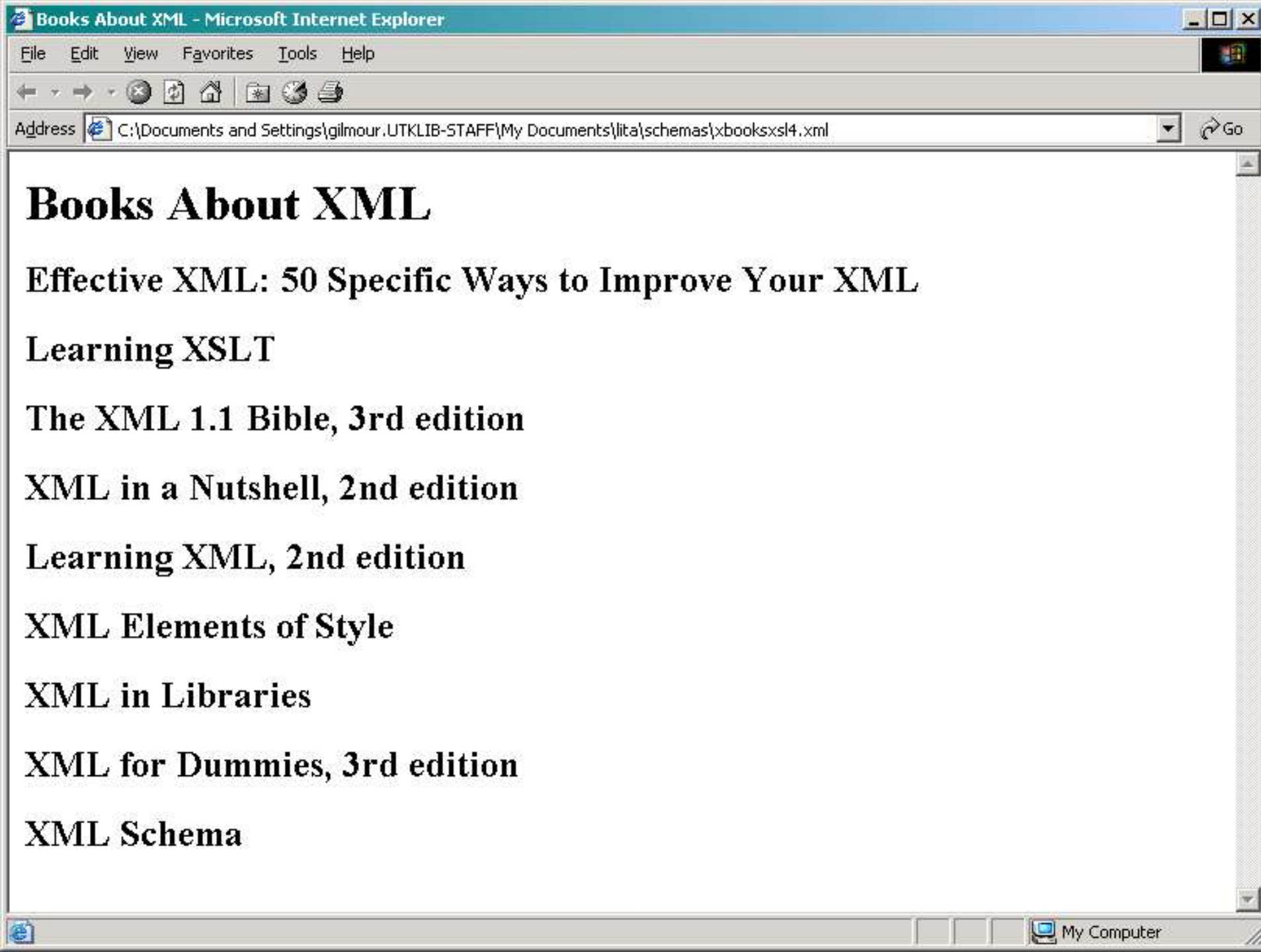
Second Template

```
<xsl:template match="book">  
  <h2>  
    <xsl:value-of select="title"/>  
  </h2>  
</xsl:template>
```


Transformation Output

```
<html>
<head>
<META http-equiv="Content-Type" content="text/html;
charset=UTF-16">
<title>Books About XML</title>
</head>
<body>
<h1>Books About XML</h1>
<h2>Effective XML: 50 Specific Ways to Improve Your
XML</h2>
<h2>Learning XSLT</h2>
<h2>The XML 1.1 Bible, 3rd edition</h2>
<!-- etc. -->

</body>
</html>
```



Books About XML

Effective XML: 50 Specific Ways to Improve Your XML

Learning XSLT

The XML 1.1 Bible, 3rd edition

XML in a Nutshell, 2nd edition

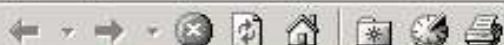
Learning XML, 2nd edition

XML Elements of Style

XML in Libraries

XML for Dummies, 3rd edition

XML Schema



```
<?xml version="1.0" encoding="utf-8" ?>
- <xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
  <!-- First template: matches the document root and sets up the high-level HTML tags --
  >
- <xsl:template match="bibliography">
- <html>
- <head>
  <title>Books About XML</title>
  <style type="text/css">table, th, td {border-width: narrow; border-style:solid; } td
    {padding: 0.5em; }</style>
</head>
- <body>
  <h1>Books About XML</h1>
- <table>
  <th>Author</th>
  <th>Title</th>
  <th>Year</th>
  <th>Price</th>
  <th>ISBN</th>
- <xsl:apply-templates>
  <xsl:sort data-type="number" select="year" />
  </xsl:apply-templates>
</table>
</body>
</html>
</xsl:template>
<!-- Second template: matches the book element and prints each book's title as an H2 --
->
```

Second Template

```
<xsl:template match="book">
  <tr>
    <td><xsl:value-of select="author/last_name"/></td>
    <td><i><xsl:value-of select="title"/></i></td>
    <td><xsl:value-of select="year"/></td>
    <td><xsl:value-of select="price"/></td>
    <td><xsl:value-of select="@isbn"/></td>
  </tr>
</xsl:template>
```

Simple XPath Expression

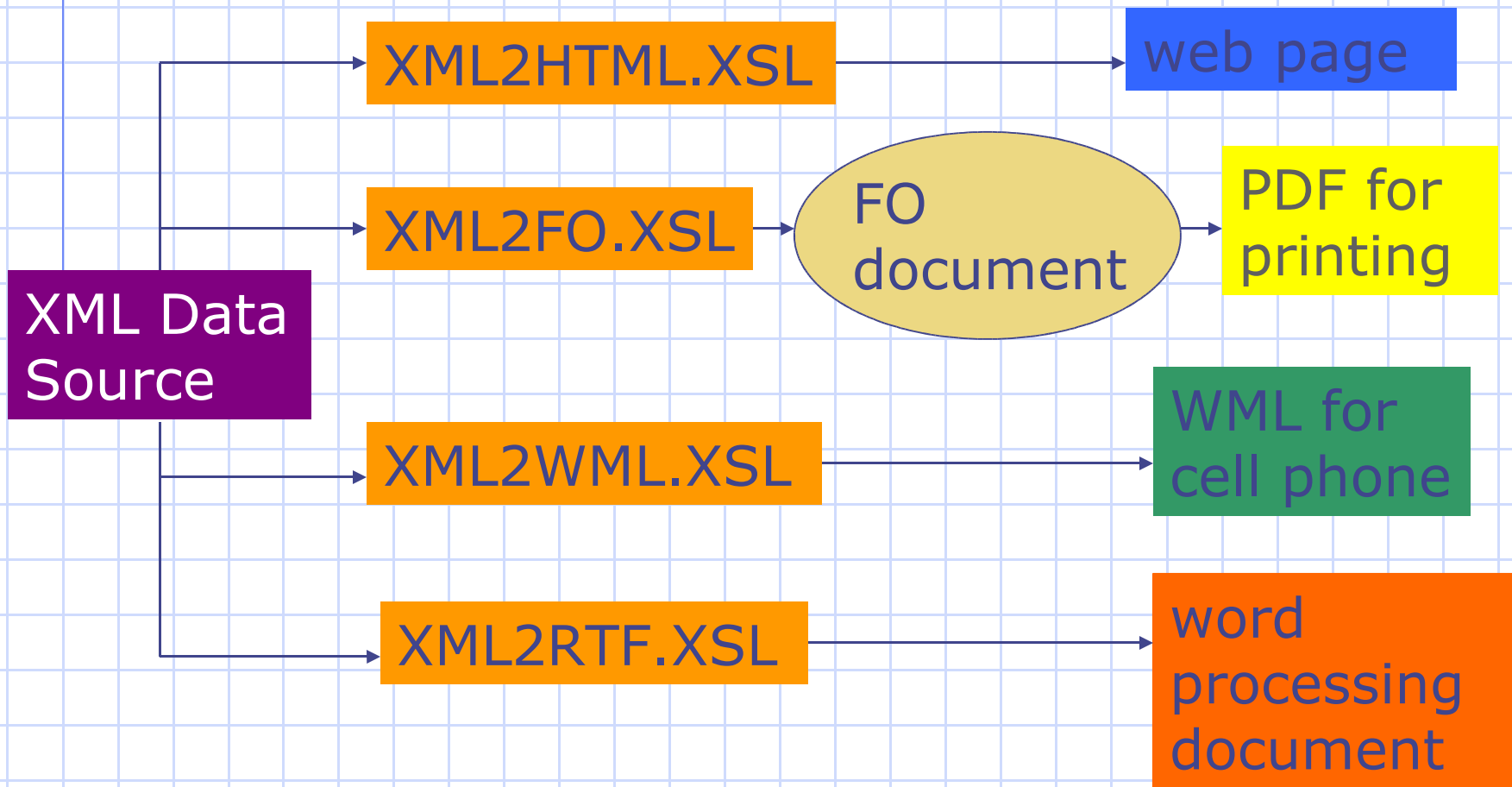
```
<xsl:value-of  
select="author/last_name"/>
```

The value of the
"last_name" child
element of the
"author" element

Books About XML

Author	Title	Year	Price	ISBN
St. Laurent	<i>XML Elements of Style</i>	2000	\$29.99	007212220X
Harold	<i>XML in a Nutshell, 2nd edition</i>	2002	\$39.95	0596002920
Tennant	<i>XML in Libraries</i>	2002	\$75.00	1555704433
Tittel	<i>XML for Dummies, 3rd edition</i>	2002	\$24.99	0764516574
Van der Vlist	<i>XML Schema</i>	2002	\$39.95	0596002521
Fitzgerald	<i>Learning XSLT</i>	2003	\$34.95	0596003277
Ray	<i>Learning XML, 2nd edition</i>	2003	\$39.95	0596004206
Harold	<i>Effective XML: 50 Specific Ways to Improve Your XML</i>	2004	\$44.99	0321150406
Harold	<i>The XML 1.1 Bible, 3rd edition</i>	2004	\$39.99	0764549863

XSL Transformation Workflow




```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE research_guide (View Source for full doctype...)>
- <research_guide>
- <meta>
  <Title>Chemistry: A Brief Guide to Reference Resources</Title>
  <Date>2000-11-08</Date>
  <Language>en</Language>
  <Subject>chemistry</Subject>
  <Relation>http://www.albany.edu/library/virtual/subject/chem.htm</Relation>
  <Creator email="gilmr@albany.edu">Ron Gilmour</Creator>
</meta>
- <section ID="glit">
  <section_title>Guides to the Literature</section_title>
- <entry>
  <entry_title>How to Find Chemical Information, by Robert E. Maizell</entry_title>
  <callnumber>SCIENCE REF QD 8.5 M34 1998</callnumber>
  <annotation>Thorough, up to date treatment on the use of chemical information sources.
    Includes chapters on Chemical Abstracts, Beilstein, and Gmelin.</annotation>
</entry>
</section>
- <section ID="data">
  <section_title>Databases, Indexes and Abstracts</section_title>
- <entry>
  <entry_title>Chemical Abstracts</entry_title>
  <callnumber>SCIENCE REF / Index QD 1 A51</callnumber>
- <annotation>
  The definitive bibliographic resource for all fields of chemistry, dating back to 1907.
```

```
<?xml version="1.0" encoding="UTF-8" ?>
- <xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <!-- ##### ROOT TEMPLATE ##### -->
  - <xsl:template match="/">
    - <html>
      - <head>
        - <title>
          <xsl:value-of select="//meta/Title" />
        </title>
        <xsl:call-template name="metadata" />
        <style>body {background-color:#fffff; font-family:serif;} .title {font-weight:bold; font-
          style:italic;} .annotation {margin-left:4em; margin-right:2em;} .green {background-
            color:#f0fff0; width:25em; border-width:medium; border-style:double; padding:2em; text-
              align:center; margin-top:1.5em; margin-bottom:1.5em;} p {margin-left:4em; margin-
                right:2em;} h2 {margin-left:2em;}</style>
        </head>
      - <body>
        - <div align="center">
          
          <br />
          - <h1>
            <xsl:value-of select="//research_guide_title" />
          </h1>
        </div>
      - <!--
        This part creates the internal "quick navigation" links at the top of the page.
        A link is created for each "section" element, with the section name as the
        text and the section ID (prefixed by a pound sign) as the "href".
      -->
```


UNIVERSITY AT ALBANY LIBRARIES

[[Guides to the Literature](#)] [[Databases, Indexes and Abstracts](#)] [[Dictionaries and Encyclopedias](#)] [[Biography](#)] [[Handbooks and Compendiums](#)] [[Current Awareness Service](#)]

Guides to the Literature

How to Find Chemical Information, by Robert E. Maizell [SCIENCE REF QD 8.5 M34 1998]

Thorough, up to date treatment on the use of chemical information sources. Includes chapters on Chemical Abstracts, Beilstein, and Gmelin.

Databases, Indexes and Abstracts

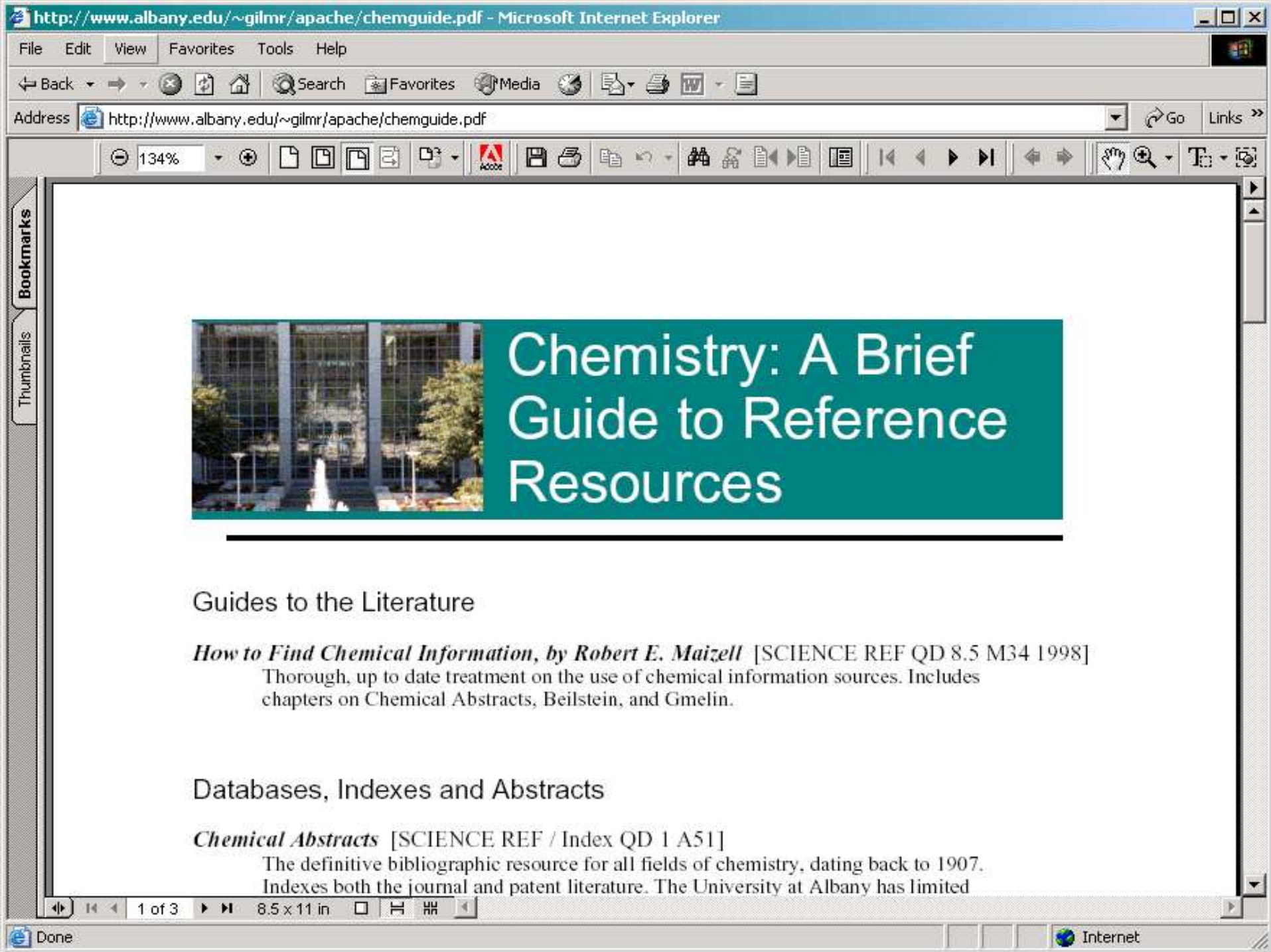
Chemical Abstracts [SCIENCE REF / Index QD 1 A51]

The definitive bibliographic resource for all fields of chemistry, dating back to 1907. Indexes both the journal and patent literature. The University at Albany has limited electronic access to the CA databases. Inquire at the Science Library reference desk for information on electronic searching. See Maizell's *How to Find Chemical Information* SCIENCE REF QD 8.5 M34 1998 or *CAS Printed Access Tools: A User Guide* SCIENCE QD 9 C37 1984 for assistance with the paper CA.

Science Citation Index [SCIENCE REF / Index Q 1 Z999 S28]

Produced by the Institute for Scientific Information, this indexes the core journals in chemistry (about 250 titles)

```
<?xml version="1.0" encoding="UTF-8" ?>
- <xsl:stylesheet version="1.0" xmlns:fo="http://www.w3.org/1999/XSL/Format"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
  <!-- Written for use with FOP version 0.20.3 -->
  - <xsl:template match="/">
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          top="1in" margin-bottom="1in" margin-left="1in" margin-right="1in">
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    - <fo:page-sequence master-reference="master">
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          - <fo:table-body>
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                </fo:block>
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                <xsl:value-of select="/research_guide/meta/Title" />
              </fo:block>
            </fo:table-row>
          </fo:table-body>
        </fo:table>
      </fo:block>
    </fo:flow>
  </fo:page-sequence>
</xsl:template>
</xsl:stylesheet>
```

Chemistry: A Brief Guide to Reference Resources

Guides to the Literature

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Databases, Indexes and Abstracts

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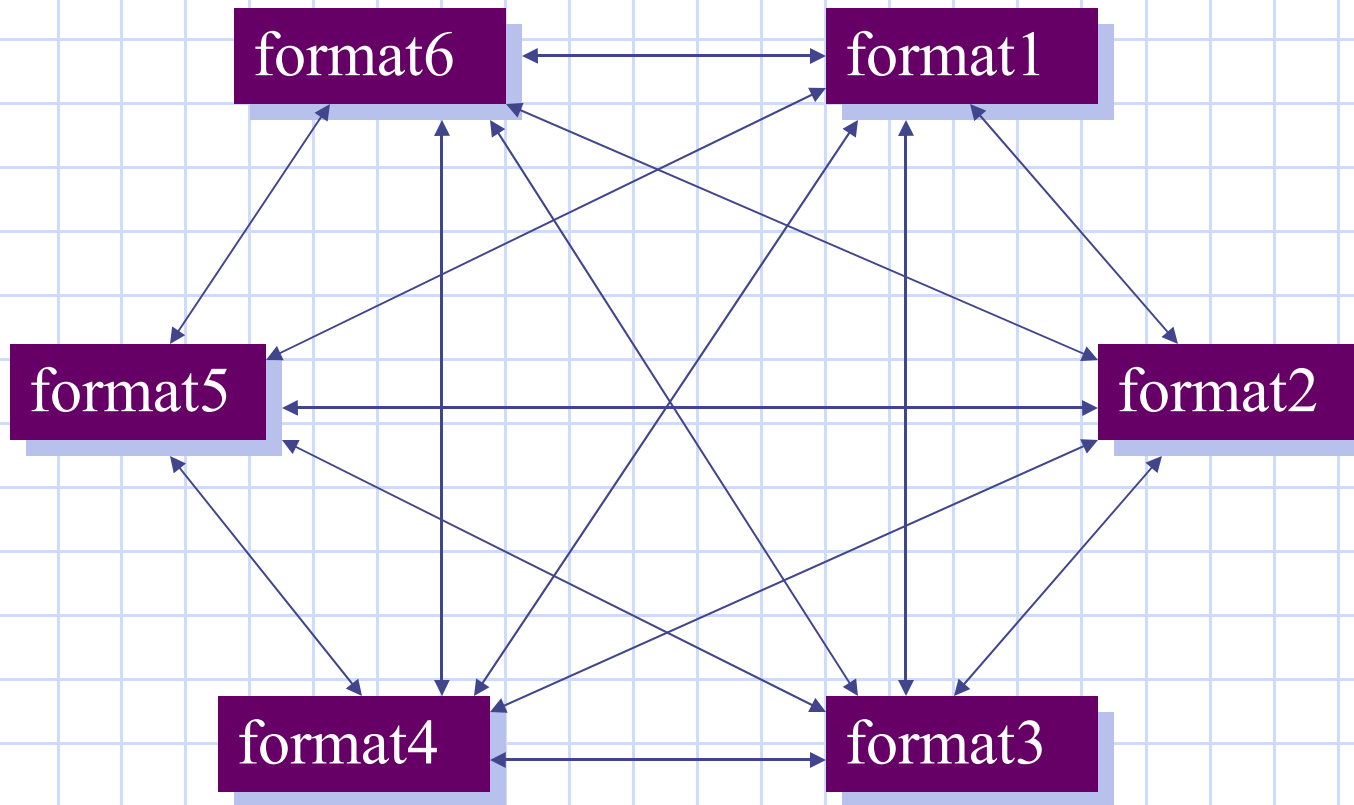
VI. The Big Picture

Why XML?

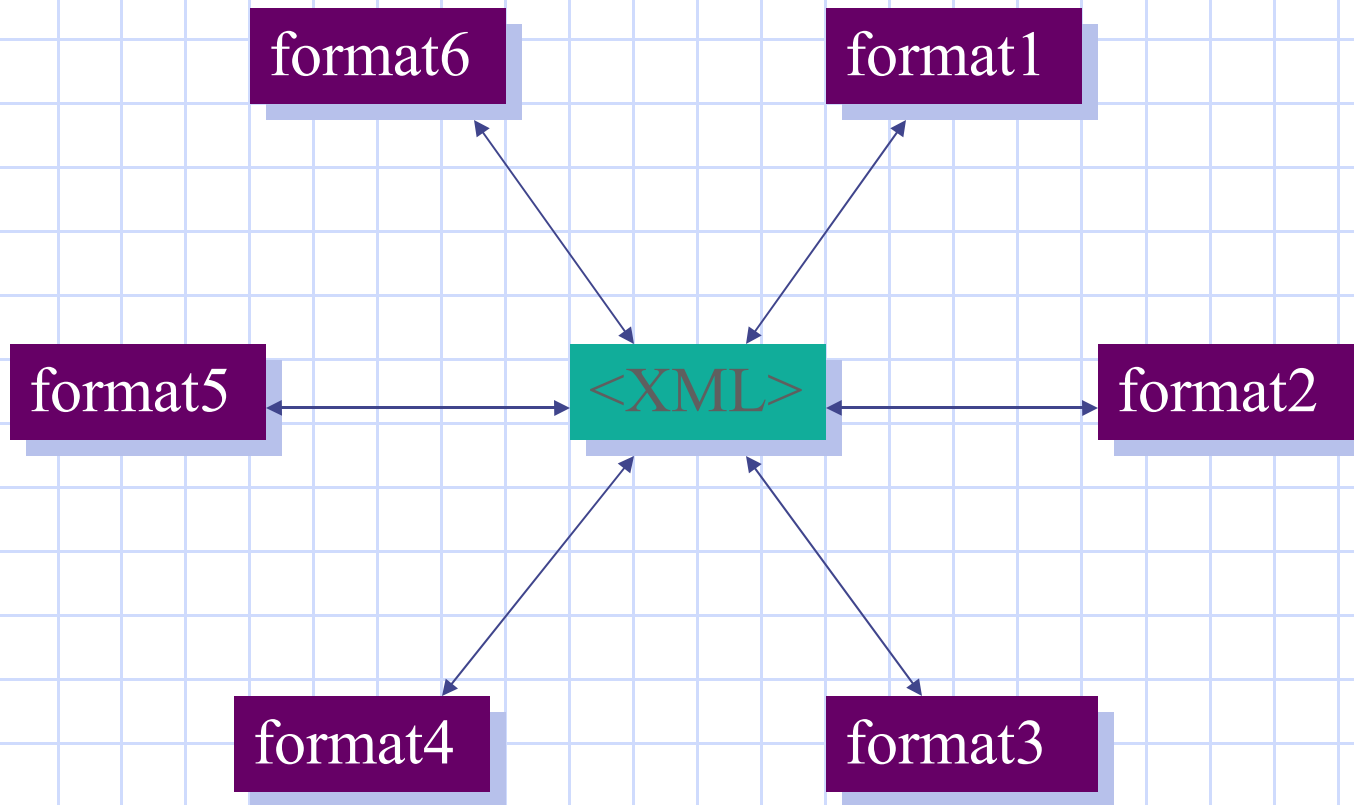
What can a DBMS do that XML can't?

- ◆ Indexing
- ◆ Efficient Storage
- ◆ Management tools (security, multiple access, etc.)

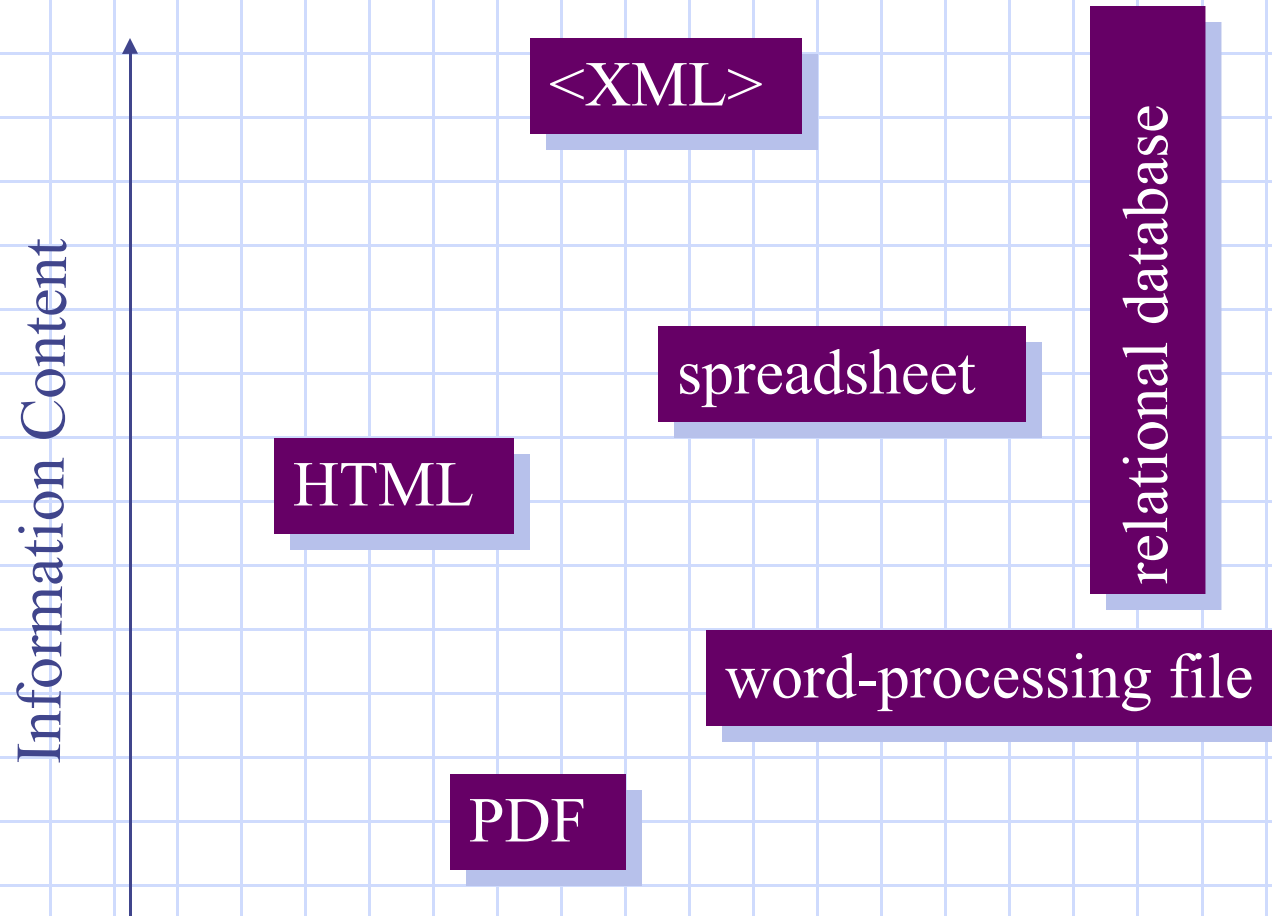
Without “hub”: need N^2-N filters



With "hub": only $2N$ filters



Thermodynamics of Information





Ron Gilmour

Science & Technology
Coordinator

Hodges Library, University of
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gilmour@lib.utk.edu

